

# **Clinical pharmacy services in a South African private hospital group, and the factors hindering their progress**

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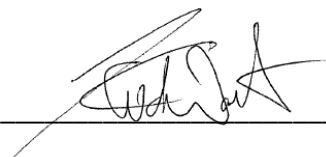
**25 November 2016**

## DECLARATION

In fulfilment of the requirements of the degree of Masters of Pharmacy in the Discipline of Pharmaceutical Sciences, School of Health Sciences, University of KwaZulu-Natal, Durban, South Africa, I, Kenneth van der Walt, declare that:

- i. The research reported in this dissertation, except where referenced, is my original work.
- ii. This dissertation has not been submitted for any degree or examination at any other university.
- iii. This dissertation does not contain other person's data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.
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- v. Where reference to a publication for which I am a principal author, I have referenced the "In Press" publication.

Student Signature \_\_\_\_\_



Date: 23 November 2016

This dissertation is dedicated to my wife, Samantha,  
my parents, grandmother and brothers.

Thank you for all the love, unwavering support and encouragement.

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## ACRONYMS AND ABBREVIATIONS

ACCP -	American College of Clinical Pharmacy
ACPE -	Accreditation Council for Pharmacy Education
ASC -	Antibiotic Stewardship Committee
ASHP -	American Society of Health-system Pharmacists
BPS -	Board of Pharmacy Specialties
CPD -	Continuing Professional Development
CPOE -	Computerised Prescriber-Order-Entry
DTC -	Drug and Therapeutics Committee
eMAR -	Electronic Medication Administration Records
FIP -	International Pharmaceutical Federation
FIP HPS -	International Pharmaceutical Federation Hospital Pharmacy Section
FTE -	Full-Time Equivalents
HCP -	Healthcare Professionals
ICU -	Intensive Care Unit
IQR -	Interquartile Range
SAPC -	South African Pharmacy Council
WHO -	World Health Organization

## Table of Contents

DECLARATION .....	i
ACKNOWLEDGMENTS.....	iii
ACRONYMS AND ABBREVIATIONS .....	iv
LIST OF TABLES.....	viii
LIST OF FIGURES.....	ix
LIST OF APPENDICES .....	x
ABSTRACT.....	1
CHAPTER I: Introduction.....	2
Background .....	2
Problem Statement.....	3
Purpose of the Research .....	3
Overall Aim.....	3
Objectives .....	4
Chapter II: Literature Review .....	5
2.1 Health care structure and hospital pharmacy in South Africa.....	5
2.2 Clinical pharmacy in the United States and other high-income countries .....	6
2.3 The value of the clinical pharmacist .....	8
2.4 Clinical pharmacy in low- and middle-income countries.....	9
2.5 Clinical pharmacy in South Africa .....	11
2.6 Clinical pharmacist training in high- and low-income countries.....	12
2.7 The Basel Statements.....	14
2.8 The hospital pharmacist's perspective on clinical pharmacy .....	16
2.9 Theoretical Framework: The need for a pharmaceutical care system .....	17
Chapter III: Methods.....	19
3.1 Study Design.....	19
3.2 Phase 1: Qualitative Study .....	19
3.2.1 Target Population .....	19
3.2.2 Inclusion and Exclusion Criteria.....	20
3.2.3 Selection of the Study Population .....	20

3.2.4 Sample size considerations .....	20
3.2.5 Collection of Data.....	20
3.2.6 Pilot Study .....	21
3.2.7 Data Analysis.....	21
3.3 Phase 2: Quantitative Study.....	21
3.3.1 Target Population .....	21
3.3.2 Inclusion and Exclusion Criteria.....	21
3.3.3 Selection of the Study Population .....	21
3.3.4 Sample size considerations .....	22
3.3.5 Collection of Data.....	22
3.3.6 Pilot Study .....	22
3.3.7 Data Analysis.....	22
3.7 Bias and Limitations .....	23
3.9 Ethics .....	23
Chapter IV: Results.....	25
4.1 Introduction .....	25
4.2 Phase 1 Qualitative study .....	25
4.2.1 Steps in the process.....	25
4.2.2 Pilot study and response rate.....	25
4.2.3 Demographics: Hospital pharmacy managers .....	26
4.2.4 Thematic Analysis: Structural and Behavioural Factors.....	26
4.2.4.1 Educational Factors.....	27
4.2.4.2 Pharmacy Operational Factors .....	30
4.2.4.3 Hospital and Governmental Influence .....	33
4.2.4.4 Behavioural Factors .....	36
4.2.5 Summary .....	37
4.3 Phase 2 Quantitative Study.....	38
4.3.1 Steps in the process.....	38
4.3.2 Pilot study.....	38
4.3.3 Survey distribution and response rate .....	38
4.3.4 Demographics: Hospital pharmacy managers and pharmacists .....	38
4.3.5 Demographics: Hospital .....	41
4.3.6 Role of the pharmacist: Priority ranking of daily tasks .....	44

4.3.7 Drug and Therapeutic Committee and Antibiotic Stewardship Committee involvement ....	46
4.3.8 Clinical pharmacy overview .....	49
4.3.9 The progression of clinical pharmacy.....	51
4.3.10 Additional comments on the barriers to clinical pharmacy progression and possible ways to overcome them .....	55
4.4 Summary .....	56
Chapter V: Discussion .....	57
5.1 Educational needs and self-confidence .....	57
5.2 Resource allocation for clinical pharmacy progression .....	62
5.3 Technology to aid clinical pharmacy development .....	65
5.4 The need for Governmental and Hospital support.....	66
5.5 Basel Statements as a tool to monitor clinical pharmacy progress.....	69
5.6 Limitations and remedial steps.....	69
5.7 Summary .....	70
Chapter VI: Conclusions and Recommendations.....	72
Bibliography .....	74
APPENDICES .....	80
Appendix A.....	81
Appendix B .....	82
Appendix C .....	84
Appendix D.....	85
Appendix E .....	86



## LIST OF TABLES

Table 2-1: The Basel Statements, influence on prescribing (BS26-BS32) .....	15
Table 4-1: Demographic Details – Hospital pharmacy managers and pharmacists .....	39
Table 4-2: Demographic Details – Hospital .....	42
Table 4-3: Pharmacist involvement in DTC and ASC .....	47
Table 4-4: Level of agreement regarding statements related to clinical pharmacy .....	50
Table 4-5: Direct effect of factors towards the progression of clinical pharmacy services .....	53

## LIST OF FIGURES

Figure 4-1: Years of Experience of Pharmacists.....	40
Figure 4-2: Number of hospital pharmacists compared to hospital size .....	44
Figure 4-3: Priority ranking of daily hospital pharmacist activities.....	45
Figure 4-4: Priority ranking of daily pharmacy manager activities .....	46
Figure 4-5: Level of agreement regarding statements related to clinical pharmacy .....	51
Figure 4-6: Direct effect of factors in support of the progression of clinical pharmacy services .....	54

## LIST OF APPENDICES

### Appendix:

A. Ethical approval from the Biomedical Research Ethics Committee (BREC) of the University of KwaZulu-Natal.....	81
B. Gatekeeper permission from the Research Operations Committee of the private hospital group.....	82
C. Informed consent document for semi-structured interview sessions.....	84
D. Semi-structured interview questionnaire.....	85
E. Survey questionnaire administered through SurveyMonkey.....	86

## ABSTRACT

**Introduction** Clinical pharmacy and the provision of patient-focused pharmaceutical care services is a hospital pharmacist's role that is slowly developing in South African private hospitals. The clinical pharmacist, as a valuable member of the health care team, has been shown to improve patient clinical outcomes. However, a number of factors hinder the progression of clinical pharmacy services in these hospitals.

**Aim** To promote the implementation of clinical pharmacy services in South African private hospitals by identifying those factors perceived by South African hospital pharmacists as barriers.

**Methods** This observational mixed methods research study was conducted between September 2015 and February 2016, across 52 private hospitals within the same purposively selected private hospital group. Pharmacy managers were recruited for semi-structured interviews during the first qualitative phase. The second quantitative phase consisted of the distribution of a survey questionnaire to 243 hospital pharmacists and pharmacy managers.

**Results** The overall response rate was poor, with only 15.9% and 30.4% recorded for the qualitative and quantitative phases, respectively. The median percentage of time that hospital pharmacists spend providing a clinical service at ward level was only 17.5%, and 76.1% of respondents stated that availability of time was negatively impacting clinical pharmacy progression. All survey respondents agreed that further formal education and training was required to progress clinical pharmacy. Hospital management support in clinical pharmacy progression was emphasised by 83.6% of the respondents. The lack of a recognised clinical pharmacist specialist registration category was identified by 70.8% of respondents as having a negative impact on clinical pharmacy progression.

**Discussion** The perceived structural and behavioural barriers to clinical pharmacy service progression were identified as being educational requirements, human resource allocation and the need for hospital and governmental support. The FIP Basel Statements on the Future of Hospital Pharmacy require local adaptation in order to be used as a tool to monitor clinical pharmacy practice in hospitals in South Africa, but should be promoted to further expose the identified barriers and initiate corrective action.

**Conclusion** The perceived barriers and steps for remedial action to educational needs, human resource allocation and hospital and governmental support are provided. Addressing these barriers will further promote and strengthen the role of the clinical pharmacist in South African private hospitals.

# CHAPTER I: Introduction

## Background

The role of a hospital pharmacist has, over the past few decades, developed into that of a provider of quality patient care.<sup>1</sup> There has been a shift away from the compounder and pharmaceutical product supplier role, as seen in the past, into a “drug therapy manager” and provider of pharmaceutical care focused on ensuring safe, effective drug therapy to enhance the patient’s quality of life.<sup>1</sup> This change in the role of the hospital pharmacist into one that is more clinically directed aims to meet the ever increasing societal need for rational medicines therapy. With such a variety and supply of medicines that are continuously being introduced to the healthcare market, the need to ensure they are used correctly and safely is of utmost importance.

Clinical pharmacy, as defined by the South African Society of Clinical Pharmacy, is “an area of pharmacy involved with the science, practice, activity and service to develop and promote the rational and appropriate use of medicines and pharmaceutical care, in the interest of the patient and the community.”<sup>2</sup> Clinical pharmacy is a pharmacy practice that aims to achieve pharmacotherapeutic objectives to enhance the patient’s quality of life, within a pharmaceutical care system.<sup>3</sup> Through the provision of patient-specific pharmaceutical care, clinical pharmacists are becoming valuable members of the clinical healthcare team. The inclusion of the pharmacist in the clinical decision-making process can lead to reductions in morbidity as well as in health-care related costs.<sup>4-6</sup>

The level of hospital pharmacy practice varies considerably from country to country and a need to explore the current state of pharmacy practice globally has been identified. The Basel Statements are a set of 75 statements that were produced by the Hospital Pharmacy Section of the International Pharmaceutical Federation (FIP) in August 2008.<sup>7</sup> The Statements were based on a global survey conducted by the FIP Hospital Pharmacy Section (HPS) to explore the current state of pharmacy practice and the challenges faced. The Basel Statements reflect the preferred future of hospital pharmacy, an ideal standard to achieve in low-, middle- and high-income countries. Clinical pharmacy forms one of the six aspects of hospital pharmacy practice incorporated within these statements which encapsulate the vision for pharmaceutical care and clinical pharmacy in the hospital setting.<sup>7</sup> In late 2011 a revision of the Basel Statements was initiated by the FIP HPS, and a total of 65 Statements were agreed upon and finalised in September 2014.<sup>8,9</sup>

Clinical pharmacy services have been extensively incorporated within the private and public hospitals of most high-income countries.<sup>10</sup> However, difficulty is experienced when establishing and sustaining clinical pharmacy services in the hospitals of low- and middle-income countries.<sup>11</sup> There are a few studies that have been conducted in developing countries focused on identifying specific factors that are hindering the implementation of clinical pharmacy services. Penm *et al.* have drawn attention to the attitudes and opinions of hospital administrators, pharmacy directors, dispensing and clinical pharmacists, in both tertiary and secondary hospitals in China, towards specific external factors hindering clinical pharmacy development.<sup>12</sup> Such a study exploring the hospital pharmacists' perspectives of clinical pharmacy in private hospitals has not been conducted in South Africa. This type of study can be of value in identifying the level of clinical pharmacy services already present in private hospitals in the country, as well as highlighting the factors preventing implementation and further development.

## **Problem Statement**

In what way do private hospital pharmacists' perspectives of clinical pharmacy and other structural and behavioural factors hinder clinical pharmacy service progression in South African private hospitals?

## **Purpose of the Research**

Hospital pharmacists are becoming more clinically involved in the patient treatment process through participation in ward rounds, collaboration with other healthcare professionals (including medical practitioners) in multidisciplinary teams, as well as by providing direct patient counselling and medicines therapy review. As the demand for pharmaceutical care increases, the implementation and maintenance of sustainable clinical pharmacy models in South African private hospitals remains a challenge. This study aims to expose those challenges perceived by hospital pharmacy managers and pharmacists working within this environment, in order to identify ways in which to overcome them and further aid in the progression of clinical pharmacy in South Africa.

## **Overall Aim**

To promote the implementation of clinical pharmacy services in South African private hospitals by identifying those factors perceived by a group of South African hospital pharmacists as barriers.

## Objectives

The specific objectives of the study were:

- 1) To obtain the views and attitudes of selected pharmacy managers, through telephonic or face-to-face interviews, on their perspectives on clinical pharmacy services within private hospitals in South Africa, and to analyse these responses by means of thematic analysis.
- 2) To conduct an electronic survey aimed at pharmacists and pharmacy managers in a private hospital group in order to identify the possible factors hindering the development of clinical pharmacy services in South Africa.
- 3) To make recommendations on actions that could be taken by private hospital pharmacy managers in order to advance the implementation of clinical pharmacy services in their practice settings; based on the findings of the electronic survey, telephonic and face-to-face interviews.
- 4) To make recommendations to private hospital senior management on the strategic actions needed to advance the implementation of clinical pharmacy services in their practice settings, based on the findings of the electronic survey, telephonic and face-to-face interviews.

## Chapter II: Literature Review

Clinical pharmacy is an additional role to dispensing that the hospital pharmacist can play in providing pharmaceutical care services aimed at improving the patient's clinical outcome. This role has been recognised and implemented to varying degrees in different countries. This chapter highlights the value of the clinical pharmacist within the multidisciplinary health care team, as well as exploring those key differences in clinical pharmacy progression within low-, middle- and high-income countries and how these compare to the progress within South Africa. This chapter also establishes the need for a pharmaceutical care system as the foundation on which clinical pharmacy is built.

### 2.1 Health care structure and hospital pharmacy in South Africa

The population of South Africa was estimated in mid-2016 at 55.91 million people with 80.7% of the population self-identified as Black African.<sup>13</sup> The total population is serviced by both the public and private health care sectors. The governmental, public sector health care structures of the country consist of a National Department of Health (which implement national policies, strategies and standard treatment guidelines), and 9 provincial health departments (which are responsible for health service delivery).<sup>14</sup> Funding for services delivered in the public sector is based on an equitable-share approach used to draw up the national and provincial health budgets.<sup>14</sup>

In contrast to public sector health care, 17% of the total population is privately insured and are, by and large, serviced by health professionals and facilities within the private sector.<sup>14</sup> Private health care is provided by nine hospital groups, with the majority of private hospitals in South Africa being part of the three largest private hospital groups. Netcare, Medi-Clinic and Life Healthcare account for 66.5% of all private hospitals in South Africa.<sup>15</sup> There are 216 private hospitals providing 31 000 hospital beds to the private sector. Private health care is primarily funded by medical schemes and to a lesser extent out-of-pocket payments by patients. At the end of 2013 there were 87 medical schemes in operation with a total beneficiary count of 8.78 million.<sup>16</sup> The total health care benefits paid to health care providers in 2013 was R112.5 billion (an average amount spent per beneficiary per annum being over R12 000) with 35.3% (or R39.7 billion) contributed by hospital expenditure.<sup>16</sup> In total South Africa spent 8.5% of gross domestic product (GDP) on health in 2015 with 4.3% coming from the private sector.<sup>17</sup>

General tax revenues account for 40% of the total health care finance needed to provide health care to the majority of the population who are served by the public sector, while 45% of the total health care



funding comes from private medical schemes servicing only the insured minority.<sup>18</sup> South Africa is planning to bridge the divide between the public and private health care sectors by implementing National Health Insurance, a system of universal access to health care for all.<sup>19</sup> This is a complex process which is expected to take up to 14 years to be implemented.<sup>14</sup>

There are 10 academic institutions across the country which offer undergraduate pharmacy courses leading to professional registration.<sup>20</sup> All pharmacists working in the country are required to register with the South African Pharmacy Council (SAPC), the regulatory body for pharmacy. Currently there are 13 981 registered pharmacists in South Africa and of these 60.9% are female with 55% self identified as White, 20% as Black Africans and 20% as Indian/Asian.<sup>20</sup> There are only 13 specialist pharmacists currently registered with the SAPC.<sup>20</sup> Once qualified, pharmacists can enter the profession in community, institutional (public and private), academic, manufacturing, wholesale or consultant pharmaceutical practice areas.<sup>21</sup> Apart from registered pharmacists, the pharmaceutical workforce also consist of pharmacist interns, community service pharmacists and pharmacist's assistants (at learner basic, basic, learner post basic and post basic levels). There are currently just over 1000 pharmacist interns, 649 community service pharmacists and just fewer than 19 000 pharmacist assistants registered with the SAPC.<sup>20</sup> The focus of this study is on registered pharmacists currently employed within the private institutional sector.

## **2.2 Clinical pharmacy in the United States and other high-income countries**

The American Society of Health-system Pharmacists (ASHP) conducts an annual national survey aimed at determining the current state of pharmacy practice and technologies used within the hospital setting and the role played by pharmacists.<sup>10</sup> The annual survey covers six components of the medication-use process and includes: prescribing, transcribing, dispensing, administration, monitoring and patient education.<sup>10</sup>

Pedersen *et al*, through the 2013 ASHP national survey of pharmacy practice in hospital setting: prescribing and transcribing, were able to highlight the importance of pharmacy and therapeutics committees and the role of the hospital pharmacist within these committees.<sup>10</sup> The Pharmacy and Therapeutics Committee (PTC) or Drug and Therapeutics Committee (DTC) is a multidisciplinary entity that promotes the rational use of medicines with focus on medication safety by identifying particular areas of inefficiency and drug use problems.<sup>22</sup> In brief, "[t]he goal of the DTC is to ensure that patients are provided with the best possible cost-effective and quality care through determining what medicines will be available, at what cost, and how they will be used."<sup>22</sup> The clinical pharmacist is a key role player in the DTC, with the objective of promoting the rational use of medicines within

his/her particular facility. These committees provide an essential service and their importance is often overlooked.

The results of the 2013 ASHP survey also showed that, of the 1439 hospitals included in the sample, the most common health care professional consultations between pharmacists and prescribers were about dosage adjustments (98.3%) followed by drug information (93.2%), recommendations for antibiotic therapy (91.7%) and pharmacokinetics (91.5%).<sup>10</sup> In terms of technology used in hospitals in the US, 92.6% of hospitals included in the survey had electronic health records (EHR) and 65.2 % of hospitals used computerised prescriber-order-entry (CPOE) systems with clinical decision support. As the survey report remarked: “Handwritten medication orders have virtually disappeared in US hospitals”.<sup>10</sup> Barcode-assisted medication administration systems (used to verify patient identity and to check doses administered by nurses electronically) and electronic medication administration records (eMAR) were also frequently used in the majority of these hospitals.<sup>10</sup> Automated dispensing cabinets are a decentralised medication distribution system (i.e. medication stored and electronically dispensed in remote areas outside of hospital pharmacy) that is used in a large majority of US hospitals.<sup>23</sup> Other devices used include automated systems (or robots) and medication carousels, which are both used centrally (i.e. within the hospital or satellite pharmacy).<sup>23</sup> These automated medication dispensing and distribution units aid in ensuring medication safety through barcode-assisted dispensing and administration, but they also aim to free up the pharmacist from time-consuming distributive and dispensing roles to allow for more patient-focused care and clinical work.

The 2015 ASHP national survey of pharmacy practice in hospital settings, which focused on monitoring and patient education, showed that the majority of hospitals surveyed had pharmacists who were increasingly providing drug therapy management services.<sup>24</sup> This survey also showed an increase in pharmacist and pharmacy technician involvement in patient education and medication reconciliation, tasks which have most often been associated with nursing staff. In terms of staffing, the average number of pharmacist full-time equivalents (FTE) per hospital was 11.4, with an additional 11.0 FTE pharmacy technician per hospital, though both measures varied with hospital size.<sup>24</sup>

Pharmacy technicians within the United States play a vital role in aiding the pharmacist in ensuring the safe and effective use of medicines within the hospital. The partnership between pharmacist and pharmacy technician is a key factor in promoting the patient-centred clinical roles of the pharmacist. The ASHP strongly feel that changing the way pharmacy technicians are educated, regulated and incorporated in pharmacy practice will advance the roles of the pharmacist.<sup>25</sup> Pharmacy technicians in the US are considered to be the “foundation of the pharmacy’s distributive function” and are slowly

becoming more utilised in advanced, specialised clinical roles through the competence gained from further education and training.<sup>25</sup>

The 2015 ASHP survey highlighted the extent to which pharmacists are exploring the clinical roles performed on a daily basis. A national survey of pharmacy practice and technologies used in South African hospitals would be of great interest, as the same clinical practice areas could be explored locally. We need to investigate whether processes are being used in public and private hospitals in South Africa that aid the hospital pharmacist in providing more clinical services to their patients; only then can the true value of the clinical pharmacist be discovered and entrenched.

## 2.3 The value of the clinical pharmacist

Clinical pharmacists are valuable members of the clinical health care team. Pharmacists have been shown to improve patient clinical outcomes through the provision of non-dispensing services.<sup>26</sup> The provision of clinical pharmacy services has been shown to reduce hospital admissions, emergency department visits, drug-related hospital readmissions as well as health care related costs and length of stay.<sup>4,5</sup> Clinical outcomes, including high blood pressure and cholesterol as well as high blood glucose in diabetic patients, have been managed more effectively and have shown improvements with patients exposed to pharmacist-provided services compared to a control group.<sup>26</sup> This was also shown in a study conducted by Al Mazroui *et al.* where the provision of pharmaceutical care to Type 2 diabetes mellitus patients resulted in better glycaemic control and reduced cardiovascular risk scores.<sup>27</sup> Hospital pharmacists have also contributed to the improvements in the management of symptoms in patients with asthma through the provision of comprehensive medication counselling and education on the disease.<sup>28</sup> Zhang *et al.* showed that clinical pharmacist involvement in a paediatric ward (in suggesting treatment options and identifying medication errors) resulted in reduced length of stay and improved drug compliance for patients with respiratory system diseases.<sup>29</sup>

A study conducted by Bond *et al.* has shown that the incorporation of several clinical pharmacy services (including pharmacist-provided drug use evaluation, in-service education, adverse drug reaction management, pharmacist participation on medical ward rounds and admission drug histories) were associated with reduced mortality rates in United States (US) hospitals.<sup>6</sup> An association was shown between the number of clinical pharmacists per 100 occupied beds and reduced deaths per 1000 hospital admissions.<sup>6</sup> It was suggested that this study was only able to infer an association between clinical pharmacy services and mortality rates, but could not show causality, as it relied on hospital data that was self-reported.<sup>30</sup>

Bond *et al.* suggested that the core set of pharmacist-provided clinical pharmacy services should incorporate the following: participation in cardiopulmonary resuscitation (CPR) teams, in-service education, adverse drug reaction (ADR) monitoring, drug information, medical round participation, drug protocol management and admission drug histories.<sup>6</sup> A systematic review study conducted by Kaboli *et al.* suggested that involvement in ward rounds, interviewing patients, reconciling medication and providing patient discharge counselling and follow-up all improved patient outcomes.<sup>31</sup> As these studies took place in US hospitals, where clinical pharmacy is more recognised, their applicability to South African hospitals may be limited. However, they may provide areas of key focus for the role of the clinical pharmacist during the establishment of these services in South African hospitals.

All of the above-mentioned studies demonstrated the value of clinical pharmacy services in hospitals by improving patients' clinical outcomes, their quality of life as well as by reduction in healthcare-related costs. However, external validity is a limitation commonly identified in such studies, as few have been based on large multi-centre clinical trials of the introduction of clinical pharmacy services with appropriate controls.

## 2.4 Clinical pharmacy in low- and middle-income countries

Clinical pharmacy services in low- or middle-income countries are vastly different from those delivered in high-income countries. Clinical pharmacy in high-income countries has been developed and successfully integrated within stable drug management, drug distribution and regulatory mechanisms.<sup>32</sup> However, in low- and middle-income countries, clinical pharmacy is seen as an isolated concept as these countries struggle to get core areas of drug distribution implemented and maintained safely and effectively.<sup>32</sup> Without an effectively run medication distribution system in place, within urban and rural areas of a country, the exploration of other non-dispensing roles of the pharmacist is not considered to be of high priority.

Pharmacists are recognised as a scarce skill occupation in low- and middle-income countries, and there is a need to increase pharmacist numbers to meet the health demands of such countries.<sup>33</sup> Global observational surveys conducted by the World Health Organization (WHO) indicate that the number of pharmacists per 1000 population in low- and middle-income countries like South Africa (0.413 per 1000 population, in 2012), India (0.501 per 1000 population, in 2012) and China (0.269 per 1000 population, in 2011) are low when compared to high-income countries like the United Kingdom (0.812 per 1000 population, in 2013), Australia (1.016 per 1000 population, in 2012) and New Zealand (1.006 per 1000 population, in 2011).<sup>34</sup> It is recognised by the FIP that in developing countries the pharmaceutical services required should be largely distributive in nature, but as the

numbers of pharmaceutically-trained personnel increase, the role of the pharmacist could diversify into more clinical areas.<sup>33</sup> The shortage of pharmacists makes the drug distributive task in developing countries a major challenge. Hawthorne and Anderson found that even though the available literature showed that the pharmacy curricula in developing countries were similar to those of developed countries, the highly competent individuals that graduated were not prepared for their particular countries' demands, thus contributing to their frustration when entering practice.<sup>35</sup> The results of this systematic review of the global pharmacy workforce showed that there is a greater migration of pharmacists from less developed to more developed countries.<sup>35</sup> The health care needs and demands of the country greatly dictate the roles that the health care providers will need to provide. Only once stable drug delivery systems can be established and maintained will the demand for more patient-focused clinical care begin to be met.

South Africa is considered an upper middle-income country. In lower-middle income countries, like Pakistan, pharmacists are in a transition period where their role in patient care is not being fully explored due to the health systems challenges being experienced.<sup>36</sup> The role of the pharmacist in improving the health care system is also not being recognised.<sup>36</sup> To improve the clinical pharmacist role in these highly populous countries does not only require an increase in the number of qualified pharmacists but also an increase in appropriately trained pharmacists to provide that role. In India there is a large number of qualified pharmacists, however the pharmacy curriculum there is largely focused on the needs of the pharmaceutical industry.<sup>36</sup>

Babar *et al.* suggested that the barriers to effective pharmacy practice in low- and middle-income countries can be seen at a macro, meso and micro level.<sup>11</sup> The underdevelopment of the health system itself could be hindering the further progress of these services at a macro level. The meso level is represented by the level and quality of the services the pharmacist is currently in a position to provide, which could either aid or hinder further effective pharmacy practice. Lastly, the micro level is represented by pharmacists themselves and the training and education they have to effectively implement this practice.<sup>11</sup> The level of clinical pharmacy practice and other additional roles of the pharmacist cannot be considered to be the same for all countries that are deemed to be low- and middle-income, as there are vast regional differences in the level of the barriers described by Babar *et al.* More nationwide surveys, like the annual ASHP survey in the United States, need to be conducted to gain insight into the level of pharmacy practice being offered and the challenges that are experienced.

## 2.5 Clinical pharmacy in South Africa

Through the recent emergence of carbapenem-resistant Enterobacteriaceae (CRE) carrying the New Delhi metallo- $\beta$ -lactamase-1 gene<sup>37</sup> as well as *Klebsiella pneumonia* carbapenemases (KPC)<sup>38</sup> in South Africa, the need for antibiotic stewardship programmes has gained prominence in both public and private sector hospitals. The Federation of Infectious Diseases Societies of Southern Africa (FIDSSA) arranged the first South African Antibiotic Stewardship Programme (SAASP) conference in February 2012.<sup>39</sup> Through the development of these antibiotic stewardship programmes throughout hospitals in South Africa, the need for clinical pharmacy services aimed at monitoring antibiotic use has become more evident. This non-dispensing service has created a new role for the hospital pharmacist and has been the main focus of clinical pharmacy over recent years, particularly in private hospitals. In a 5-year prospective study conducted by Brink *et al.*, non-specialist hospital pharmacists in the private sector have shown that they are able to achieve considerable improvements in the rational use of antibiotics.<sup>40</sup> Antibiotic stewardship can be seen as the first step in clinical pharmacy service implementation in South Africa. However, clinical pharmacy involves complete drug therapy monitoring and management through the provision of pharmaceutical care. Clinical pharmacy in South Africa, like in many other low- and middle-income countries, is still very much in the early developmental stage.

One of the major barriers to the progression of clinical pharmacy in South Africa is the lack of a specialist register at the SAPC. Currently, pharmacists in South Africa can gain entry to only two specialist registers, as either a Radiopharmacist or a Pharmacokineticist.<sup>41</sup> In December 2014, the SAPC issued Board Notice 152 of 2014, which proposed that the Minister would be asked to amend the “Regulations relating to the registration of persons and the maintenance of registers” to allow for the provision of 2 new pharmacist speciality categories, namely Clinical Pharmacist and Public Health Pharmacy and Management.<sup>42</sup> For clinical pharmacist registration the proposed amendment requires a professional master’s degree (NQF level 9) which will be practice-based with a large component being work-integrated learning.<sup>42</sup> To date there has not been any finalisation of the proposed amendments and registration as a specialist clinical pharmacist in South Africa is still not available. In the public sector there is a need for clinical pharmacist registration in order to implement the agreed occupation-specific dispensation (OSD). Clinical pharmacist posts can only be created once the SAPC introduces a register for this category.<sup>43</sup> The way in which clinical pharmacists will eventually be incorporated in the private sector once the registration is eventually finalised remains to be seen.

As mentioned above, pharmacy support staff play a major role in the development of clinical pharmacy services by freeing the pharmacist to perform more clinical, non-distributive roles. In South

Africa, the pharmacy support staff cadre consists of pharmacist's assistants, and very recently, the pharmacy technicians and pharmacy technical assistants. However, currently there is not yet a separate register for pharmacy technicians and pharmacy technical assistants, and those who have completed the newly accredited training are required to register as pharmacist's assistants (post basic) with the SAPC.<sup>44</sup> The course for pharmacy technicians was first approved and started in 2013 at the Nelson Mandela Metropolitan University (NMMU), with the first qualified technicians completing their training in April 2015.<sup>45</sup>

Pharmacy support staff, both pharmacist's assistants (post basic) and pharmacy technicians in community and institutional pharmacies, are required by legislation to perform their roles strictly under the direct supervision of a pharmacist.<sup>46</sup> Within primary health care clinics, both pharmacy technicians and pharmacist's assistants (post basic) will require only indirect supervision by a pharmacist.<sup>46</sup> As pharmacy technicians are to be a new introduction to pharmacist support cadre in South Africa, the full extent of their role in alleviating the dispensing and distributive roles of the pharmacist in community pharmacies and institutional pharmacies remains to be seen. Whether the roles of the pharmacy technician will follow those seen in the US and free pharmacists from the labour-intensive dispensing and drug distribution tasks is as yet unclear. Whether there will be sufficient recognition of the pharmacy technician role within hospitals in the private sector to create demand for this cadre is also of interest for the future.

## **2.6 Clinical pharmacist training in high- and low-income countries**

The level of clinical pharmacy services provided in hospitals differs considerably amongst low-, middle- and high-income countries. This can be linked largely to the differences in education and training received by hospital pharmacists entering the hospital field as well as differences in the respective pharmacy practice needs within the country.

In the US, growth and development of new drugs, increased number of authorised prescribers, broader medical insurance coverage and a need for an expanded scope of practice for pharmacists (amongst many other factors) led to a great increase in the demand for pharmaceutical services which could not be met by the existing workforce. This led to a nationwide pharmacist shortage in the late 1990s.<sup>47</sup> One factor aimed to alleviate the demand for the extended unmet needs of pharmaceutical care and the expanding roles of the pharmacist required to meet these needs, was the change from Bachelor of Science (B.S.) degree to the PharmD as the entry level degree for practising pharmacists by the Accreditation Council for Pharmacy Education (ACPE) in 2000.<sup>47</sup> Clinical pharmacists can, after completion of the PharmD, enter a two year residency programme. The first year (PGY1) enhances

the residents' knowledge on managing medication use systems and is focused on achieving optimal outcomes in a wide range of disease states.<sup>48</sup> The second year (PGY2) increases the residents' knowledge, skills and attitudes towards medication therapy management and clinical leadership within a selected speciality practice area.<sup>48</sup> The American College of Clinical Pharmacy (ACCP) has created a strategic plan to ensure that the residency programme becomes the standard for pharmacists entering hospital practice in the US, as was summarised in the following statement on the future of the pharmacy profession: "Formal, postgraduate residency training will become mandatory before one can enter practice".<sup>49</sup> Residency programmes create a great advantage for clinical pharmacists working in the field.

The ACCP has compiled a comprehensive list of core competencies that are required by a clinical pharmacist, once graduated from the PharmD or residency program, to enter the profession and provide the patient care and pharmacotherapy management that is needed.<sup>48</sup> These competency statements are included in areas of "clinical problem solving, judgment, and decision making", "communication and education", medical information evaluation and management", "management of patient populations" and "therapeutic knowledge".<sup>48</sup>

In the UK, there has been a change from the 3-year Bachelor of Science (BSc) degree and one year pre-registration work to a 4-year MPharm program followed by a compulsory one-year work programme before one can register as a pharmacist with the General Pharmaceutical Council (GPC), which has taken over the regulatory role of the Royal Pharmaceutical Society of Great Britain (RPSGB).<sup>50</sup> This degree is the shortest of the European pharmacy degrees, which generally range from 5 to 6 years.<sup>50</sup> The Bologna principles stipulate that in order to enter a masters postgraduate degree one needs to complete a bachelors degree.<sup>51</sup> The structure of the 4 year integrated MPharm qualification in the United Kingdom consists of 3 years at a bachelor level followed by one year at masters level and therefore complies with the Bologna principles of having to complete 2 cycles.<sup>51</sup> Damian Day, head of accreditation at the Royal Pharmaceutical Society at the time, stipulated that the MPharm qualification in the UK is not an undergraduate degree, as there is a possibility to only complete 3 years with a bachelors degree if need be.<sup>51</sup>

In 2008, the Pharmacy Council of India introduced the PharmD programme, which consists of six academic years (five years' full-time study and one year of internship or residency in specialised units).<sup>52</sup> This qualification exists alongside others, including the Diploma in Pharmacy (DipPharm), Bachelor of Pharmacy (BPharm), Master of Pharmacy (MPharm) and Doctor of Philosophy (PhD). The PharmD qualification contains a more standardised syllabus allowing better exposure to clinical pharmacy subjects and practical exposure to clinical research than the BPharm degree.<sup>53</sup> However,



many challenges are facing these PharmD students, including a lack of current awareness about PharmD courses and poor recruitment into Indian hospitals as clinical pharmacists by the Indian government, resulting in a scarcity of jobs for these newly-qualified graduates.<sup>53</sup> The PharmD is thus not a standard pre-requisite to practise as a pharmacist in India.

In South Africa, pharmacists are required to complete a 4-year undergraduate Bachelors degree (BPharm), followed by a year of pre-registration work (during which a final qualifying examination is written), followed by a year of community service experience in the public sector. Registration with the SAPC is a requirement to practise as a pharmacist in South Africa. There are a few Master of Pharmacy (MPharm) qualifications that are offered as well as one Doctor of Pharmacy (PharmD) programme.<sup>14</sup> Currently the scope of practice of a pharmacist with or without postgraduate qualification is not mutually exclusive.<sup>14</sup> As mentioned before, there is a proposal for a specialist clinical pharmacist register, but this has not been finalised.<sup>42</sup> This proposal also called for the completion of a particular Master of Pharmacy programme as a requirement to register as a clinical pharmacist in South Africa, which will require 2 years of full-time postgraduate training.<sup>42</sup> There is no mention of recognition of current qualifications or prior learning in meeting minimum requirements for registration.<sup>14</sup> As was seen in India, it is unclear whether a specialised clinical pharmacy programme in South Africa (whether it be based on a new MPharm or PharmD programme) will be supported by sufficient demand through the creation of posts for clinical pharmacists in the public and private sectors. This support is necessary to make the specialist register viable in the long term and to ensure that the new roles are recognised and accepted by other healthcare providers.

## 2.7 The Basel Statements

The Basel Statements were initially set out by the Hospital Pharmacy Section (HPS) of the FIP in August 2008 in Basel, Switzerland.<sup>7</sup> These statements were based on a global survey that was submitted to each of the 192 United Nations member states plus China-Taiwan, aimed at analysing the existing state of hospital pharmacy around the world.<sup>54</sup> It resulted in a list of 75 statements carefully developed to reflect the ideal vision of pharmacy practice in a hospital pharmacy environment.<sup>7</sup> Six aspects describing the full scope of the profession within the hospital setting were incorporated within these statements.<sup>7</sup> The aspects include: medicines procurement, influence on prescribing, preparation and delivery of medicines, administration of medicines, monitoring of medicines as well as human resources and training.<sup>7</sup> Clinical pharmacy services, being that of a provision of pharmaceutical care to the patient outside of normal dispensing processes, is clearly described within the “influence on prescribing” aspect of the Basel Statements (BS26 – BS32).

**Table 2-1: The Basel Statements, influence on prescribing (BS26-BS32)<sup>7</sup>**

No.	Basel Statement text
26	Hospitals should utilize a medicine formulary system (local, regional, and/or national) linked to standard treatment guidelines, protocols, and treatment pathways based on the best available evidence.
27	Hospital pharmacists should be members of pharmacy and therapeutics committees to oversee all medicines management policies and procedures, including those related to off-label use and investigational medicines.
28	Hospital pharmacists should have a key role in educating prescribers at all levels of training on the access to and evidence for optimal and appropriate use of medicines, including the required monitoring parameters and subsequent prescribing adjustments.
29	Hospital pharmacists should be involved in all patient care areas to prospectively influence collaborative therapeutic decision-making.
30	Hospital pharmacists should be an integral part of all patient rounds to assist with therapeutic decision-making and advise on clinical pharmacy and patient safety issues.
31	Hospital pharmacists should provide continuity of care by transferring patient medicines information as patients move between sectors of care.
32	Postgraduate clinical courses should be developed to prepare hospital pharmacists for collaborative prescribing of medicines, including instruction in legal and professional accountability; this role of hospital pharmacists should be promoted in the curricula of other health professionals.

Since their inception, the Basel Statements have led to a series of independent studies being conducted across the globe, especially in the Western Pacific Region, to determine the extent to which current hospital pharmacy practice meets the desired standards.<sup>12,55,56</sup> These studies also aid to create a benchmark for pharmacy practice in other countries in the area to use for comparison and improvements.<sup>8</sup>

Recently there has been a revision process for the Basel Statements which started in late 2011 and was finalised by the FIP HPS in September 2014.<sup>8,57</sup> It was found that the majority of respondents involved in the voting process agreed that the Basel Statements were acceptable as written and did not need to be revised. After the revision process, a final total of 65 Basel Statements were agreed upon and accepted.<sup>8,9</sup> The revision of the ‘influence on prescribing’ aspect of the Basel Statements resulted in the change from the 7 statements (as shown in Table 2.1) to 6 revised statements. The first 3

statements were deemed to be appropriately worded and were not amended (they became revised Basel Statements 24 – 26). The next 3 revised Statements were reworded as follows:<sup>9</sup>

Revised statement 27: *Hospital pharmacists should be an integral part of the multidisciplinary team responsible for therapeutic decision making in all patient care areas.*

Revised statement 28: *Hospital pharmacists should promote seamless care by contributing to the transfer of information about medicines whenever patients move between and within health care settings.*

Revised statement 29: *Appropriately trained and credentialed hospital pharmacists should participate in collaborative prescribing.*

As discussed earlier, many studies have been conducted showing the importance or potential value of clinical pharmacy services in hospitals. However, there are many possible external factors (for example pharmacy staff structuring, hospital funding, governmental pressures) that could challenge the implementation of these services, and which may differ between countries. These factors can challenge the ability of achieving the vision of ideal pharmacy practice in a hospital environment, as set out in the Basel Statements.

## **2.8 The hospital pharmacist's perspective on clinical pharmacy**

A study conducted by Penm *et al.* set out to determine the views of hospital administrators, pharmacy directors and hospital pharmacists on the factors that are affecting clinical pharmacy service implementation in China.<sup>12</sup> The interview guide used was developed based on seven of the Basel Statements, as shown in Table 2.1, and was administered as either a face-to-face interview or with a group of participants at a time.<sup>12</sup> This study identified 3 themes highlighting the factors affecting clinical pharmacy services. The first factor, “external factors outside of pharmacy control”, explored governmental policies and areas of support or the lack thereof as well as a shortage of hospital funding in secondary hospitals to provide attractive salaries to highly trained pharmacists.<sup>12</sup> Clinical pharmacists were also not seen as an income-generating healthcare professional (as compared to medical practitioners) for the hospital.<sup>12</sup> The second theme of “resources for clinical pharmacy services” discussed the problem of a shortage of pharmacists and lack of sufficient clinical pharmacist training including the lack of proper formal evaluation of clinical pharmacists.<sup>12</sup> The last theme, “expectations of clinical pharmacists and their self concept”, highlighted a lack of pharmacist self confidence resulting from limited clinical knowledge and the unwillingness to take on professional

responsibility for drug therapy as problem factors.<sup>12</sup> The perception of the idea of clinical pharmacy by other healthcare professionals was also a factor discussed in this study.

A study such as that conducted by Penm *et al.* has not been done in South Africa, and would be of importance as hospital pharmacy practice develops a more clinical role. The focus of the present study is to explore the possible challenges to clinical pharmacy in South Africa, from the hospital pharmacists' perspective. By identifying possible hindering factors we can begin to look at and develop strategies to overcome them and create a clinical pharmacist position that is recognised in South Africa.

## **2.9 Theoretical Framework: The need for a pharmaceutical care system**

Clinical pharmacy aims to achieve pharmacotherapeutic objectives that enhance the patient's quality of life, within a pharmaceutical care system.<sup>3</sup> Clinical pharmacy therefore has at its core the provision of patient-specific pharmaceutical care.

Hepler and Strand originally defined pharmaceutical care as “the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life”. They defined the desired outcomes as “(1) cure of a disease, (2) elimination or reduction of a patient's symptomatology, (3) arresting or slowing of a disease process, or (4) preventing a disease or symptomatology”.<sup>58</sup> Hepler and Strand further described that “pharmaceutical care involves a process through which a pharmacist cooperates with a patient and other professionals in designing, implementing and monitoring a therapeutic plan that will produce specific therapeutic outcomes for the patient”.<sup>58</sup>

Over the past 50 years there has been a move away from the traditional apothecary role of preparation and selling of medicinal products to the role of dispenser of prefabricated drug products (during the rise of pharmaceutical industry in drug manufacture).<sup>58</sup> The change of the primary role of the pharmacist limited to simply dispensing drugs based on a prescription order resulted in the pharmacist becoming “over-trained for what they did and under-utilised in relation to what they knew”.<sup>59</sup>

Preventable drug-related morbidity and mortality remains a serious problem affecting healthcare today. These drug-related problems can be due to inappropriate prescribing, inappropriate drug delivery (where the medicine is either not available or due to dispensing errors), inappropriate behaviour of patients (non-compliance), patient idiosyncrasy (mistake/accident or idiosyncratic response in patient) and inappropriate monitoring.<sup>58</sup> Through the incorporation of clinical pharmacy

and use of a pharmaceutical care system the rates of preventable drug-related morbidity and mortality can be reduced.<sup>58</sup> The FIP policy on Good Pharmacy Education Practice has stated:<sup>60</sup>

*The implementation of Pharmaceutical Care, while recognising the responsibility of the patient as end user of a medicine, required the pharmacist to use a range of processes to facilitate the responsible provision of medicinal treatment until tangible results are achieved, improving the patient's quality of life.*

Improvement of the patient's quality of life, reducing patient length of stay as well as reducing healthcare-related costs can all be associated with eliminating preventable drug-related morbidity and mortality. The pharmacist has a responsibility in preventing drug-related problems through increasing effectiveness of drug therapy as well as in monitoring and preventing adverse drug events.<sup>58</sup> Therefore, the adoption of a role that can meet the ever increasing demand for comprehensive pharmaceutical care services is required for the longevity of the profession. The professional purpose of the pharmacist should remain first and foremost clinical.<sup>58</sup>

## Chapter III: Methods

Having considered the literature regarding clinical pharmacy in South Africa, the need to explore those barriers to its progression was identified. Identifying and investigating the views and attitudes of the hospital pharmacist of the challenges perceived towards clinical pharmacy development was thus the focus of this study. How these tools were developed and distributed and the results analysed is detailed within this chapter.

### 3.1 Study Design

Pharmaceutical care, a concept defined by Hepler and Strand in 1990,<sup>58</sup> is the foundation of the role of the clinical pharmacist and thus formed the theoretical model that this study was based upon. This was an observational mixed methods research study comprising of both a qualitative first phase and a quantitative second phase. This study was conducted across 52 private hospitals within the same purposively selected private hospital group in South Africa. The researcher is employed by the same private hospital group, and so was able to obtain gatekeeper permission for the study and to negotiate access to staff members. The initial qualitative phase of this study consisted of semi-structured (one-on-one) interview sessions and this was followed by a quantitative online survey phase.

### 3.2 Phase 1: Qualitative Study

The qualitative phase of this mixed methods research study was designed to deeply explore the views and attitudes of pharmacy managers towards clinical pharmacy services that are currently provided and the barriers that are being experienced with regard to its further implementation in the private hospital sector.

#### *3.2.1 Target Population*

The qualitative phase of this study involved the recruitment of pharmacy managers within the selected private hospital group. This population group was selected for the semi-structured interview sessions as the sample population would represent multiple hospitals. This would aid in obtaining a wide range of opinions and views on the topic as each hospital would only have one pharmacy manager contacted. Pharmacy managers were also expected to have more experience and knowledge of the operations of their hospital pharmacy related to the level of clinical pharmacy service implementation.

### *3.2.2 Inclusion and Exclusion Criteria*

The population group for Phase 1 comprised of pharmacy managers only. Hospital pharmacists were excluded from this phase of the study. Pharmacist's assistants, pharmacist interns and pharmacy students were excluded from this research study.

### *3.2.3 Selection of the Study Population*

Non-probability sampling methods, and more specifically purposive sampling, were chosen for the qualitative phase, as this allowed for the selection of those individuals most knowledgeable about clinical pharmacy (i.e. hospital pharmacy managers) in order to get the most relevant information and feedback.

The sampling methods used for the qualitative phase of this study were as follows. Firstly, a sampling frame in the form of an email list of all pharmacy managers was obtained. An initial email (with introduction letter and ethical approval forms), followed by subsequent reminder emails, were sent to all pharmacy managers within the population group requesting anyone interested in participating in a telephonic or face-to-face interview session to reply. In order to increase the number of respondents due to poor response, seven pharmacy managers were chosen from the email list and sent more personal requests for the interview session.

### *3.2.4 Sample size considerations*

The qualitative phase of the study had a sample size target set at 10 to 15 respondents or until the point where no new themes emerged from the semi-structured interview sessions (saturation point).

### *3.2.5 Collection of Data*

The semi-structured interviews were conducted face-to-face or telephonically depending on preference, convenience or accessibility. The interview questionnaire (see Appendix D) was drawn up based on the FIP Basel Statements on the Future of Hospital Pharmacy, as initially issued after the 2008 Global Conference on the Future of Hospital Pharmacy (specifically BS26 to BS32).<sup>7</sup> This was used as a guiding structure, but the interview was not restricted to these statements or questions. Informed consent was obtained from all respondents who were willing to participate. All interview sessions were recorded and later transcribed.

### *3.2.6 Pilot Study*

The semi-structured interview was piloted on two pharmacy managers to determine their understanding of the questions asked and whether the questions were appropriate. The pilot study also helped determine the interview duration time, which was found to be an average of 45 minutes.

### *3.2.7 Data Analysis*

All interview sessions were recorded and later transcribed as Word documents. Using a deductive approach to qualitative analysis, the transcript text was divided broadly into 3 groups: processes already in place within the hospital, perceived barriers to clinical pharmacy, and suggested ways of overcoming these barriers. Selective coding was then used to further categorise the data into common themes that emerged, related to these 3 broad categories. The qualitative data were then presented in thematic prose, with supporting quotes relating to the themes identified.

## **3.3 Phase 2: Quantitative Study**

The quantitative phase of this mixed methods research study was designed to further explore the views and attitudes of pharmacists and pharmacy managers towards clinical pharmacy services in the private hospital sector, based on the themes identified during the qualitative phase of the study.

### *3.3.1 Target Population*

The target population for the quantitative second phase of the study incorporated all permanently employed hospital pharmacists and pharmacy managers within the selected private hospital group.

### *3.3.2 Inclusion and Exclusion Criteria*

This population group comprised of both dispensing and clinical pharmacists as well as pharmacy managers. Pharmacist's assistants, pharmacist interns and pharmacy students were excluded from this research study.

### *3.3.3 Selection of the Study Population*

The non-probability, purposive sampling method used for the quantitative phase involved obtaining a list of all hospital pharmacists currently employed within the hospital group. Only those pharmacists that were employed in the hospital environment and had an active email account were selected from this list (thus forming the sampling frame). An initial email (with introduction letter and ethical approval forms) followed by subsequent reminder emails were sent to all hospital pharmacists and pharmacy managers within the population group requesting anyone interested in participating in an



online survey to follow the link included. The population size was 243 hospital pharmacists and pharmacy managers.

#### *3.3.4 Sample size considerations*

Response rates for survey questionnaires are generally expected to be low. Therefore the quantitative phase of this study had a sample population size target set at a minimum of 30% response rate. As the study was expected to be hypothesis-generating rather than hypothesis-testing in nature, no *a priori* assumptions could be used to support a formal sample size calculation.

#### *3.3.5 Collection of Data*

The quantitative survey questionnaire was drawn up partly based on the themes identified in the qualitative research phase. The survey was created electronically using the SurveyMonkey platform<sup>61</sup> and the access link was distributed to all pharmacists and pharmacy managers within the private hospital group via email. This internet-based self-completion questionnaire approach was chosen as it could quickly and easily be administered to the entire group. Such methods were also convenient for the participants, as they could complete the questionnaire in their own time. This method was also expected to reduce any potential interviewer effect or bias.

#### *3.3.6 Pilot Study*

The survey questionnaire was administered to 4 hospital pharmacists working within a selected private hospital in the group, to determine their understanding of questions asked and whether the questions were clearly worded and appropriate. The pilot study was used to determine whether there were any difficulties experienced with the internet survey (including access and ease of use). On the basis of the pilot study, the time to complete the survey was estimated to be about 15 minutes.

#### *3.3.7 Data Analysis*

All quantitative survey data was collated by the SurveyMonkey website and downloaded as a Portable Document Format (PDF) file. The individual respondent transcripts were then screened for completeness and accuracy and any invalid responses were omitted. All descriptive statistics were analysed and reported using Microsoft Excel. As this was an observational study, intended to be hypothesis-generating, no attempt was made to subject any of the quantitative data to inferential statistical analysis.

### 3.7 Bias and Limitations

The study instrument was not formally validated. However, it was based on previously validated studies of Penm *et al.*, conducted in the Western Pacific region.<sup>12,55,56</sup> A pilot study was conducted beforehand to determine the face validity and applicability of the research tools to be used.

This study incorporates the views and perspectives of hospital pharmacists and pharmacy managers within a single private hospital group and this could limit generalisability of results to all private hospital pharmacists in South Africa. Other private hospital groups could have different levels of clinical pharmacy services already implemented, which in turn may alter the perspectives of the hospital pharmacists employed there. The research tools used in this study (semi-structured interview and survey questionnaire) can however be applied to hospital pharmacists in other private hospital groups as well to hospital pharmacists in public hospitals in South Africa.

As the survey questionnaire was being sent via email (all pharmacists and pharmacy managers should be provided with a work email address) the participant response rate was dependent on how regularly emails were checked. A second email was sent as a reminder and also to inform any participant who may have been on leave or out of office during time of the first email. Recently employed pharmacists (without operational email addresses as yet) could have been omitted from the population group.

The survey link emailed to each participant was not specific to that individual respondent in order to ensure confidentiality. However, this meant that the survey could be filled out more than once by the same respondent. It was emphasized in all follow-up reminder emails that the survey should only be completed once per respondent.

The survey required self-reporting, so the accuracy of data may therefore have been limited by the completeness and accuracy of the participants' responses. The study was also limited to the number of survey responses received, as self-completion questionnaires generally have low response rates.

### 3.9 Ethics

The ethical approval for this study was obtained from the Biomedical Research Ethics Committee (BREC) of the University of KwaZulu-Natal (Reference number: BE264/15). The ethical approval letter is shown in Appendix A. Gatekeeper permission was obtained from the selected private hospital group, as shown in Appendix B.

This study included a qualitative and a quantitative phase using semi-structured interviews and a survey questionnaire. There was no risk of social harm or any adverse effects to the participants for this study. The main ethical consideration that was addressed in the study is that of confidentiality and privacy.

The semi-structured interviews were conducted face-to-face or telephonically, whichever was appropriate. Informed consent was obtained prior to the interview (see Appendix C – Informed consent document). The pharmacy manager's personal identification details were not recorded during the interview and any demographic details that were required were not linked to the specific hospital pharmacy in which he/she was employed. The participant was informed fully of the intended research study and was asked whether he/she consented to the interview as well as to the audio recording of the interview. All recordings and transcripts of the semi-structured interview will be kept for maximum of 6 months after the study (as password-protected computer files, only accessible by the researcher) after which it will be deleted. Each recording is kept under a coded number that will not be linked to participant identification.

The survey was an internet-based questionnaire that was distributed via email. The email contained only a link to the survey and was not linked with the email address of the respondent. There was no recording of any personal identification information on the survey questionnaire, only certain demographic information was requested. Each participant was informed of the intent of the study and was required to agree to informed consent in order to proceed. There are no incentives provided, nor were there any sponsors for this research study.

## Chapter IV: Results

### 4.1 Introduction

The data collection and analysis for this mixed methods research study was conducted using 2 phases: an initial qualitative phase using one-on-one interview sessions with pharmacy managers, followed by a quantitative phase involving the distribution of a survey questionnaire to all pharmacy managers and hospital pharmacists within the selected private hospital group.

### 4.2 Phase 1 Qualitative study

The qualitative study was developed to approach all pharmacy managers within the hospital group in order to comprehensively explore their views and attitudes towards clinical pharmacy services and the progression thereof in relation to the global ideal vision of hospital pharmacy practice as provided by the Basel Statements (BS26 to BS32).<sup>7</sup>

#### *4.2.1 Steps in the process*

The steps used in the implementation of the qualitative study were:

1. A questionnaire based on the Basel Statements (BS26 to BS32)<sup>7</sup> was developed, aimed at exploring the views and attitudes of pharmacy managers to clinical pharmacy services within their hospitals (see Appendix D).
2. A pilot study was conducted with 2 pharmacy managers to determine the appropriateness and understanding of the questionnaire.
3. An email list invitation was issued to all pharmacy managers within the private hospital group to participate in an interview session.
4. The informed consent of willing participants for the interview was elicited (see Appendix C)
5. In-depth, one-on-one, semi-structured interview sessions were held with all willing participants either face-to-face or telephonically.
6. All transcripts were transcribed and then thematically analysed.
7. The themes and results of the qualitative study were incorporated in the construction of the survey instrument for the quantitative study.

#### *4.2.2 Pilot study and response rate*

The first 2 semi-structured interviews were conducted face-to-face and were used as pilot study interviews in September 2015. No changes needed to be made to the questions as they were

interpreted without ambiguity. The pilot interviews did however help to determine the most efficient arrangement of questioning to allow for ease of thematic flow of ideas without unnecessary interruption back and forth. It was also determined that an average of 45 minutes was needed to complete the session. The remaining five interviews were conducted telephonically due to convenience and logistical reasons. These interview sessions were held during October and November 2015. As no changes to the instrument were made, the pilot interviews were included in the final sample.

A total of 7 interviews were therefore conducted with 6 pharmacy managers and one regional clinical pharmacist from various hospitals of the same selected private hospital group within South Africa. The clinical pharmacist was included in the interview sample due to poor response received from pharmacy managers to repeated email requests for interviews. An initial email request and subsequent reminder email together with an introduction sheet, consent form and ethical approval forms were sent out to 44 pharmacy managers in the group in September and October 2015 and only two responses were received. As the response rate was very poor it was decided to send out more personalised email requests to 7 selected pharmacy managers from the population list. From this request a further 3 pharmacy managers were willing to participate in the interview session. Unfortunately, the initial minimum target set of 10 respondents was not achieved. However, after the 7 individual semi-structured interview sessions were held no new themes seemed to emerge and therefore the investigation was deemed to have reached saturation. The ultimate response rate was therefore 7/44 (15.9%).

#### *4.2.3 Demographics: Hospital pharmacy managers*

The 7 respondents interviewed were between the ages of 30 to 41 years, with the majority being female (5 respondents; 71.4%). The 6 pharmacy managers interviewed had 7 to 10 years' of managerial experience, except for one manager who had only been appointed recently (7 months' experience). All interviewees had a BPharm degree as their highest qualification, with one pharmacy manager in the process of studying towards a Master's degree. The clinical pharmacist was the only respondent currently with a Master's degree. The 7 interviewees were referred to as PM 1 to PM 7 during the transcript analysis.

#### *4.2.4 Thematic Analysis: Structural and Behavioural Factors*

After thematic analysis of all 7 interview transcripts, certain closely linked common themes started to emerge and could be isolated. The factors that hinder the progression of clinical pharmacy services within these private hospitals were categorised into structural and behavioural factors. The structural factors are external factors that could be further divided into educational factors, pharmacy

operational factors and hospital and governmental influence. These three structural factors are already in place and to a large extent are not under the pharmacists' or even pharmacy managers' control. The behavioural factors are internal factors of a personalised nature and centre around the individual staff pharmacists' needs and attitudes. The sections that follow expand on these factors with supporting verbatim quotes highlighting the perceived barriers to implementing clinical pharmacy and possible methods of how to overcome them.

#### *4.2.4.1 Educational Factors*

Educational factors, and in particular the current level of knowledge of the pharmacist was one of the most commonly identified factors perceived by pharmacy managers to be hindering clinical pharmacy development in South African private hospitals. It also appeared to be a key area of focus for starting to overcome these barriers to aid the progression of clinical pharmacy service development.

There is a need for pharmacists to take personal responsibility for their own clinical knowledge as the current knowledge shortfall results in the pharmacist only performing minimum (basic) level pharmaceutical (clinical) interventions. PM 4 mentioned that:

*“pharmacists must improve their own knowledge...not think they know, they must know...pharmacists want to do interventions but don't have the background or knowledge to back themselves up”.*

PM 4 went on further and explained that the hospital group head office is trying to implement certain restriction criteria to preserve newer antibiotic agents and prevent inappropriate use, but pharmacists struggle to enforce these policies due to their lack of clinical knowledge and the need for individualisation of each patient case.

PM 1 mentioned that the clinical knowledge of the pharmacist (gained during the undergraduate degree) tends to decrease from the community service year, as the community service pharmacist's work tends to be more focused on stock procurement and logistic tasks rather than clinical work. Furthermore, the interview sessions revealed that clinical pharmacy needs to be promoted in the curricula of other healthcare providers, but before this can successfully be done the clinical knowledge of the pharmacist needs to be improved. PM 2 mentioned the following in relation to promoting the role of the clinical pharmacist in the curricular of other healthcare professionals:

*“It will make a difference but we first need to be up-skilled to promote it. Doctors will be comfortable in double-checking with the pharmacist if we can play up to that role. We*

*need to be at that level [of clinical knowledge] to build the relationship and establish that trust.”*

The lack of practical application of clinical knowledge was also mentioned as a challenging factor for clinical pharmacy services being provided by the hospital pharmacist. PM 6 mentioned that pharmacists generally lack physical interaction at ward level, especially when medicines are being administered and therefore are not exposed to the observed/experienced effects of commonly used medicines, as opposed to the theoretical effects:

*“I find that we know the mechanism of action of drugs, but in nursing they see the reversal or impact of the drug. If we are more in contact with those experiences it will better our clinical knowledge.” (PM 6)*

*“Pharmacists in SA haven’t really been involved in therapeutic drug monitoring...where we are trained in these. With the pressures of having a hospital and retail combination pharmacy one loses the ability to check all those factors or one tends to forget.” (PM 1)*

Specialisation was mentioned a number of times during the interview sessions as one way of overcoming the challenge to clinical pharmacy due to poor clinical knowledge:

*“Specialising will empower the pharmacist to study further and to give them accountability and responsibility. The doctor will now have a ‘go to’ person for a specific field of medicine.” (PM 7)*

*“I feel that pharmacists should be able to specialise in certain fields because there are so many facets of pharmacy, as currently they expect the clinical pharmacist to be a specialist in all types of medicines.” (PM 1)*

PM 1 also mentioned specialisation in relation to clinical pharmacists acting as medicine consultants and through a mutual trust greatly enhancing the therapeutic relationship with the attending prescriber. This in turn was expected to increase the pharmacist’s responsibility for patient care:

*“If a person is a specialist in a field, as pharmacists in South Africa are more generalists, and they educate people around them, they will in turn make themselves known as a wealth of information on a specific topic. Doctors will consult with that*

*person and build trust that will increase the therapeutic relationship between doctor and pharmacist. The pharmacist will in turn take up more accountability.”*

Apart from specialisation, one of the interview respondents (PM 4) mentioned the importance of pharmacists improving their knowledge of specific areas of medicine, areas in which they are meant to be very knowledgeable or better trained in (e.g. pharmacokinetics, pharmacodynamics and pharmacology). Where there may be a gap in the prescriber’s knowledge, the pharmacist can aid with specific patient dose calculations or by providing continuing professional development (CPD) training to medical practitioners.

It was generally agreed that post-graduate clinical courses need to be made available to prepare clinical pharmacists for the field. In reference to clinical pharmacists needing a post-graduate degree in order to practise as such, PM 4 mentioned the following:

*“I think the pharmacist that works as a clinical pharmacist needs the degree to back them up, but this is still not the case as it is still a new role...if you don’t have the degree you must equip yourself with the correct knowledge to work as a clinical pharmacist.”*

In contrast to this position, it was also mentioned during the interview sessions that clinical material should be included in the undergraduate degree and not only as a separate post-graduate degree:

*“I feel it should be part of the course [BPharm undergraduate degree] and this course should be longer...if it is post-graduate, then most pharmacists won’t do it but if it is part of the course you are forced to do it. As you start working, the financial implications are challenging to study post-graduate courses.” (PM 6)*

University pharmacy undergraduate courses should be standardised and more clinically focused to aid the pharmacist when starting a career as a hospital pharmacist. PM 2 mentioned that universities should be made aware of the needs and goals of clinical pharmacists in private hospital practice:

*“We need to speak to the universities and say this is our goal, this is where we lacking knowledge and confidence...this is what we deal with and this is our environment, what learning material can be given.” (PM 2)*

It was suggested that courses for clinical pharmacy development should include training on literature searching, evidence retrieval and appraisal. Increased access to subscription-only resource sites was



also thought to improve the knowledge and research skill set of the clinical pharmacist. In response to the level at which pharmacists currently are able to intervene with therapy prescribed by medical practitioners in private hospital, PM 1 mentioned that:

*“there is minimum intervention required although if one has access to the literature there is input that the pharmacist can give, but don’t know whether all pharmacists are comfortable or empowered enough to do it.”*

Apart from formal training it was mentioned that there should be regular modules and testing being done to ensure that the clinical pharmacists’ knowledge remains at a high standard.

*“Modules should be done on a monthly basis and testing should be enforced. We must put the standard higher and there must be incentive. This should be done with nursing too. We need to empower the nurses as well.”* (PM 2)

*“We [hospital pharmacists] can play a much bigger role. The doctors in South Africa should start acknowledging the pharmacist, and we should start playing that role...we should have the knowledge to do it.”* (PM 2)

#### *4.2.4.2 Pharmacy Operational Factors*

The pharmacy operational factors identified during analysis of the interview transcripts that pose a significant challenge to clinical pharmacy service development within private hospitals were:

- a lack of time available for clinical work; and
- current staffing levels and staff structure requirements.

There are many other time-consuming daily activities that challenge the amount of clinical work the hospital pharmacist can do or that could be done. In response to their view of the current level of clinical pharmacy in South Africa, PM 2 said that there is:

*“still a lot to learn and a lot to do, but we can go a lot further if we have more resources to just do clinical work...if we could have 2 clinical pharmacists just doing clinical work it would help us a lot.”*

Dispensing prescriptions remains one of the top priority roles of the hospital pharmacist:

*“Your [the hospital pharmacist’s] priority is inpatient dispensing. If medication isn’t given you can’t do any clinical work. It becomes a ‘toss-up’ between using your pharmacists to dispense or having them doing clinical work...I think the [staff] structure needs to be changed a bit.” (PM 7)*

It was mentioned that there is often not enough time to get to the wards to counsel the inpatients on their medication and this task is often left to the nursing staff. Lack of available time creates a challenge for the pharmacist to attend to all inpatients especially those difficult patient cases which often require more attention. One of the pharmacy managers mentioned that:

*“A doctor has a patient list and can decide to block out his/her schedule to spend more time on a specific case. However, in hospital pharmacy if you have a difficult case you cannot block out the other patients, because you must attend to other patient scripts. It is more difficult to focus in on a specific case...it’s a workload/time problem.” (PM 1)*

Meetings (such as meeting of the Drug and Therapeutics Committee, Medicine Safety Committee, Antibiotic Stewardship Committee) are considered time-consuming and are often not a high priority, especially in hospitals with limited staffing. If these meetings are not well organized and resourceful they can be seen as time-wasting:

*“Some hospitals see medication safety meetings as something they have to do, not as something that is important to do... there are a lot [of hospitals] who are on board [with having DTC meetings in place] but there are still a few small hospitals where there may only be one pharmacist available. Here it’s not because they don’t want to, but because there is so much other work to do [e.g. dispensing] that is more important than having a committee for medication safety...sometimes there is just not enough staff for all these to happen.” (PM 4)*

In terms of current staffing levels and staffing structures within private hospital pharmacies, it was mentioned that monetary constraints in South Africa and the current poor economy play a major role in hindering the progression of clinical services. To get sufficient staffing in order to run the best clinical service based on a “pharmacist per X patient” ratio are a hindering factor as the return on investment may not immediately be identified. PM 1 explained that adjusting staffing ratios is very difficult task to accomplish:

*“Currently the mindset of pharmacy is to show us return on investment before we can increase [staffing] ratios. However, we need to increase ratios in order to offer the best clinical pharmacy services and the benefits will follow from there. Unfortunately, we have monetary constraints in South Africa.”*

PM 5 explained that good staffing models need to be determined based on hospital specific statistics, including minutes per patient needed as well as number of hospital beds to determine the minimum number of pharmacists to cover all beds. These should then be compared to international standards. A lack of time available and staff shortage are factors hindering the progression of clinical pharmacy services. Automated dispensing units were suggested as a possible aid to help free up time for the pharmacist to provide more clinical services and to follow up on therapeutic outcomes of the patient:

*“Probably one of the only other ways forward is when you start automating. Looking at a cost effective way of staffing and resourcing, probably automated dispensers are the only way to go.”* (PM 5)

*“I think it [automated dispensing units] is fantastic. Stock management and picking scripts takes up a lot of time...you don’t need a degree to take tablets off the shelf. There will be less pressure and more time for clinical work and counselling patients in retail.”*  
(PM 2)

However, negative comments were also mentioned about the use of automation in private hospitals. PM 3 was not in full agreement with resorting to automation as it did not seem practical at the moment, as it would be very costly and still required much labour and time to keep the units stocked. PM 4 also mentioned that even though there would be more free time available for pharmacists to do clinical work in the wards, hospital pharmacists would still need to ensure that base-level dispensing was performed correctly.

Incorporating pharmacy technicians in the hospital was also identified as a possible means to overcome staff shortages. PM 7 mentioned that pharmacy technicians could help with clinical work (data collection, etc) as well as stabilise the task of dispensing in order to free up the pharmacist for more clinical work. However, technicians can be a costly expense (as mentioned by PM 5), and therefore needs to be carefully considered in staff restructuring.

Another way of overcoming these barriers is to focus on educating and up-skilling the nursing staff. This could greatly ease the challenge that staff shortages pose to clinical pharmacy progression as the perceived workload of the clinical pharmacist could be minimised. PM 2 mentioned that:

*“we [pharmacists] are scarce skills...we don’t need to be involved with every patient and hand out medication but we can up-skill our nurses.”*

Given the resources currently at hand, there were different opinions as to how clinical pharmacy services should be implemented in the hospital. PM 3 mentioned that clinical pharmacy services should be performed on a rotational basis (i.e. hospital pharmacists rotate the clinical role amongst themselves) where the pharmacy provides one service and there is not a distinction between the clinical and staff pharmacists. It was further suggested that, by using a rotational approach, all pharmacists could share their knowledge and discuss patient cases, but if distinctions are made between pharmacists this would not happen. This can be considered as a “team” approach to clinical pharmacy services.

In contrast to this approach, PM 4 mentioned that clinical services should not be rotational as specific people with a keen interest and dedication to clinical work should rather be selected. The rotational method was seen as a forced approach to clinical pharmacy, as a ‘have to’ and not a ‘want to’ service.

#### *4.2.4.3 Hospital and Governmental Influence*

The factors identified as challenging clinical pharmacy service development within private hospitals were influenced both from within the individual hospitals or the hospital group as well as from other external forces or governmental involvement.

One of the commonly identified challenging factors to the progression of clinical pharmacy is linked to the fact that medical practitioners working in the private sector in South Africa are not employed by the hospital and are thus working in their own private capacity:

*“The doctor is not in our employ and decides on each patient and how they would like to treat. Doctors do have their own protocols (e.g. for pain control) that they follow, but it is not standardised as a treatment as a whole but for each individual treating doctor.”*

(PM 1)

PM 7 also mentioned during the interview that medical practitioners have been given free reign in being able to prescribe what they want in the private sector. As each treating medical practitioner

follows his/her own guidelines in prescribing, this creates difficulty for clinical pharmacists when approaching such prescribers and questioning their choices. This was elaborated by PM 5 who mentioned:

*“Each doctor being in their private capacity, check guidelines according to their own standards and are not subscribing to a minimum standard. There’s no consistency, no governance and no one checks whether these guidelines are right or wrong...doctors generally don’t regularly review their own guidelines as there is no governance. They are not subscribing to any clinical governance structure.”*

Due to medical practitioners working in their own private capacity, this poses a challenge to get prescribers involved in Drug and Therapeutics Committee (DTC) or Antibiotic Stewardship Committees (ASC). When discussing DTC meetings and doctor involvement, PM 5 mentioned that:

*“the biggest challenge is to get doctor buy-in [in antibiotic stewardship committee meetings]. A lot of doctors see it as a waste of time as they don’t get paid for it. Time is money in their private capacity.”*

A change in structure, where medical practitioners are employed by private hospitals, will also result in a change in accountability and responsibility for the patient’s clinical outcome:

*“Doctors are in their own private capacity, so ultimately they are responsible. If doctors are employed and subscribe to clinical governance of the hospital their involvement will be part of a multidisciplinary approach [to treating the patient] then all are involved and accountable.” (PM 5)*

Medical practitioners and nurses in private health care tend not to understand the role of the clinical pharmacist at ward level. Clinical pharmacy is a fairly new development in hospital pharmacy and the defined role of the clinical pharmacist is not covered in the current curriculum of other healthcare professionals. PM 7 mentioned that nurses often do not see the pharmacist as contributing to patient outcomes, but merely as a dispenser of products. The role of the clinical pharmacist is also misunderstood by patients. This may also be a contributing factor to a lack of pharmacist interaction with the patient at ward level:

*“Patients corner a pharmacist with uncomfortable questions that they may not be able to answer or will focus on service delivery issues as they do not understand the role of the*

*pharmacist [in the wards]. Patient education is vital to understand the role of the clinical pharmacist and to expect that.” (PM 1)*

*“Unfortunately pharmacists are not at the patient bedside enough to be involved in patient care and collaborative decision making. This only happens when we are contacted by the doctor or nursing sister or the patient themselves wants more information. Problem is to get pharmacists to the bedside...Once the pharmacists can move out into the wards; we can add much more value to patient care.” (PM 1)*

One of the first steps in overcoming the barriers to clinical pharmacy development within private hospital is for the need for a clinical pharmacist role to be recognised, established and clearly defined by the South African Pharmacy Council (SAPC). As stated by PM 7:

*“Government needs to define the roles of clinical pharmacists clearly.”*

Once the role of the clinical pharmacist is clearly defined by the SAPC it can be incorporated in the curricula of other healthcare professionals. Patient education and understanding of the role of clinical pharmacist will eventually follow and create a need for greater involvement by the clinical pharmacist. PM 5 mentioned the following with regard to patient education on the clinical pharmacist’s role:

*“[Patient education] will come naturally if you educate the nurses and doctors [of the clinical pharmacist role], who can then inform the patient that the pharmacist will be around and look at and explain your medicine. Multidisciplinary approach must be right from the foundation stage with all disciplines.”*

Pharmacists need to bridge the perceived gap in therapeutic relationship with the treating medical practitioners. As clinical pharmacy services develop, this gap may intensify due to a lack of a clear understanding of this new pharmacist role. PM 4 mentioned the importance of:

*“bettering our relationship with the doctors, so that they can see we are there to help and not there as a threat and telling them what to do. It’s one of the biggest challenges when doctors don’t want to listen to pharmacists...”*

A similar point was made by PM 5:

*“It involves getting [the doctor] buy in but also you [the pharmacist] must show your worth. You must show the intervention you are making as benefiting the patient or adding quality to their work. The younger doctors are generally more co-operative with this, but this takes time.”*

The DTC and ASC meetings should be more frequently and efficiently used as a tool to build therapeutic relationships with other healthcare professionals. However, due to the difficulty in getting medical practitioner involvement at these meetings, PM 5 further explained that the younger, more innovative medical practitioners tend to be more involved and should therefore be approached, but that it is vital that the pharmacists’ clinical knowledge remain up to standard and consistent.

Another challenge experience in private hospitals is the lack of support in terms of a career path for clinical pharmacists. PM 5 mentioned that once a pharmacist qualifies with a post-graduate degree there is no specific position that could be offered to retain the pharmacist within private hospital environment (other than as a senior pharmacist in a management, as opposed to clinical, position). There has been a lot of effort placed into developing clinical work, but unfortunately retaining pharmacists once they qualify remains a challenge.

It was also mentioned by respondents that there is a lack of a nationally-implemented clinical pharmacy programme for both the private and public sectors. The implementation of various forms of clinical work through hospital pharmacy has been used as a platform to compete with other private hospital groups. PM 6 mentioned that in order for clinical pharmacy to progress in South Africa, there should be a general set standard of clinical pharmacy services implemented in private and public hospitals that is driven nationally from the Department of Health or another national structure. There will always be uncertainty if each individual hospital group pursues its own idea of what constitutes clinical pharmacy, but the impact will be more marked and lasting if consensus is reached on a nationally-implemented and nationally-driven standard.

#### *4.2.4.4 Behavioural Factors*

Apart from the structural factors discussed above, a separate theme also emerged during thematic analysis of the interview transcripts identified as behavioural factors. These factors hindering the progression of clinical pharmacy can be classified as internal factors as they are individualised and are to a large extent are under the individual pharmacist’s control.

One of the biggest challenges mentioned by respondents was that of the individual pharmacist's attitude towards change. PM 4 mentioned that many pharmacists are not comfortable in the ward environment but will be happy to work daily in their 'safe zone' of the pharmacy:

*"They don't feel comfortable about going to the wards and interacting with the patient and asking questions."*

The shortfall in clinical knowledge and low commitment to CPD are major contributing factors to the lack of self-confidence experienced by many pharmacists:

*"The pharmacist's role is to advise the drugs and say what should be used...but we don't have the knowledge; we need to go and study up. We feel insecure about ourselves when going on ward rounds, we then keep quiet...it's our own fault, currently we don't have the confidence."* (PM 2)

It is vital to overcome that initial first step in clinical pharmacy and this has been achieved through forcing the pharmacist into the ward environment and increasing interaction with patients and other healthcare providers in the clinical setting:

*"When you force the issue through Bluebird<sup>1</sup> [antibiotic stewardship applications] or going on daily ICU ward rounds, it doesn't take long for that mindset to change. It's just a matter of time...you need to force the issue, which then forces you to read up and learn and that itself helps to gain further confidence."* (PM 5)

#### 4.2.5 Summary

Overall, the thematic analysis of the key informant interviews with pharmacy managers (and one clinical pharmacist) revealed a series of key factors hampering the development of clinical pharmacy in the private hospital environment in South Africa. Addressing each of these identified factors provides potential avenues for remedial action, to promote such development in the country, for the benefit of patients. The identified themes also allowed for the development of a suitable instrument for the second, quantitative phase of the study.

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<sup>1</sup> Bluebird is a software suite used as an antimicrobial stewardship tool that allows the clinical pharmacist to audit antimicrobials, access laboratory data and record interventions.



## 4.3 Phase 2 Quantitative Study

The purpose of the quantitative study was to further explore those themes and results captured during the interviews with pharmacy managers, by means of a survey instrument directed at all pharmacists in the selected private hospital group.

### 4.3.1 Steps in the process

The steps followed in the implementation of the quantitative study were:

1. The development of a questionnaire incorporating the themes and results of the interview sessions conducted during the qualitative phase of the study (see Appendix E).
2. Conduct of a pilot study with 4 hospital pharmacists to determine the appropriateness and understanding of the survey tool and questionnaire.
3. An invitation to all pharmacy managers and hospital pharmacists within the selected private hospital group, using the study population email list, to participate in an online survey.
4. The elicitation of informed consent from all willing participants before the start of the survey.
5. Capture, extraction, cleaning and analysis of the resultant quantitative data.

### 4.3.2 Pilot study

The quantitative online survey followed the qualitative semi-structured interview sessions. During the survey pilot study the survey questionnaire was given to 4 hospital pharmacists to read and review for clarity and interpretation of the questions during November 2015. The pilot study also helped to assess the data collection tool used, SurveyMonkey<sup>61</sup>, on ease of use and understanding. There was no misinterpretation of any question and no changes needed to be made prior to data collection. It was determined that the average time to complete the survey was 15 minutes.

### 4.3.3 Survey distribution and response rate

The survey link together with an introduction sheet and ethical approval forms were emailed to 243 pharmacists and pharmacy managers within the selected private hospital group in November 2015. A second reminder email was sent in December 2015 after which a total of 60 responses were received by the initial deadline date set. Due to the poor response, the deadline was extended and a further 2 emails were sent out to the group during January and February 2016. In total, 74 responses (30.4% response rate) were included for analysis.

### 4.3.4 Demographics: Hospital pharmacy managers and pharmacists

The survey respondents were mainly within the 30 to 39 year age group (30/74; 40.5%), with the majority being female (64/74; 86.5%) shown in Table 4.1. Few respondents had a qualification higher

than a Bachelor's degree, with only 21/74 respondents (28.3%) having already completed a Master's degree (MPharm, MSc or MBA) and a further 2 respondents specifying that they are in the process of completing their Master's degree. It was also noticed that a large proportion of the respondent hospital pharmacists (33/74; 44.6%) were in a senior position (as either pharmacy managers or senior pharmacists).

**Table 4-1: Demographic Details – Hospital pharmacy managers and pharmacists**

Parameter	Category	Number	%
Age	Years		
	20 – 29	20	27.0
	30 – 39	30	40.5
	40 – 49	15	20.3
	50 – 59	7	9.5
	60 or older	2	2.7
Sex			
	Female	64	86.5
	Male	10	13.5
Highest Qualification			
	Diploma	2	2.7
	Bachelor's	48	64.9
	MPharm	11	14.9
	MSc	7	9.5
	PharmD	0	0.00
	PhD	0	0.00
	Other*	6	8.1

**Table 4-1: Demographic Details – Hospital pharmacy managers and pharmacists (continued)**

Occupational title

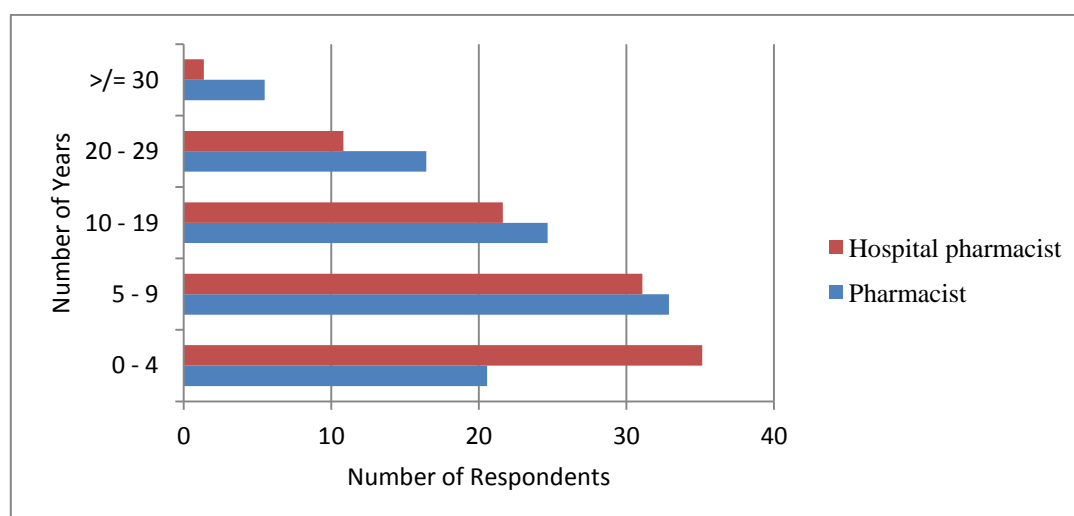
Pharmacist	22	29.7
Clinical/Ward Pharmacist	19	25.7
Senior Pharmacist	11	14.9
Pharmacy Manager	21	28.4
Other**	1	1.4

\*Responses: Final year MPharm; BPharm and BSc Hons Pharmacology; Honours in pharmacology; Honours; Currently doing MPharm; BPharm MBA.

\*\*Response: Retail Pharmacy Manager

NOTE: Private hospital pharmacies may also run a separate retail component that services the community in addition to the inpatient hospital pharmacy service.

The survey respondents generally comprised of pharmacists fairly new to hospital pharmacy. The median number of years of experience as a qualified pharmacist was 5 to 9 years (interquartile range (IQR): 5 - 19 years) and as a hospital pharmacist, 5 to 9 years (IQR: 0 - 19 years). Of the total sample population, 26/74 respondents (35.1%) had 0 to 4 years hospital pharmacy experience. The distribution of years of experience as a qualified pharmacist and as a hospital pharmacist in particular, is shown in Figure 4.1.



**Figure 4-1: Years of Experience of Pharmacists**

#### *4.3.5 Demographics: Hospital*

Only 73 respondents provided data on the hospital size and staffing. The respondent pharmacists worked in hospitals with 50 to over 500 beds. The median hospital size was 200-299 beds (IQR: 100 - 399 beds) with 3 intensive care units (ICU) (IQR 2-4) per hospital. The majority of respondents worked in medium-sized hospitals of 100 to 299 beds (41/73; 56.2%). The distribution of hospital size and number of ICUs is shown in Table 4.2.

The hospitals in which respondents worked had a median staff component of 6 pharmacists (IQR: 4-7) and 6 pharmaceutical support staff (IQR: 4-7). Almost half of all respondents (35/73; 48.0%) worked in the pharmacy with 7 or more pharmaceutical support staff members. This level of support staff provision most commonly identified in hospitals with 200 to 499 beds. The distribution of the number of pharmacists and pharmaceutical support staff in hospitals from which responses were received is shown in Table 4.2.

**Table 4-2: Demographic Details – Hospital**

<b>Parameter</b>	<b>Category</b>	<b>Number</b>	<b>%</b>
Number of hospital beds	< 50	1	1.4
n = 73	50 – 99	3	4.1
	100 – 199	21	28.8
	200 – 299	20	27.4
	300 – 399	13	17.8
	400 – 499	10	13.7
	> 500	5	6.9
Number of ICUs			
n = 73	0	0	0.00
	1	17	23.3
	2	19	26.0
	3	11	15.1
	4	13	17.8
	>= 5	13	17.8
Total number of pharmacists			
n = 73	<= 2	2	2.7
	3	7	9.6
	4	15	20.6
	5	10	15.1
	6	13	17.8
	>= 7	26	35.6

**Table 4-2: Demographic Details – Hospital (continued)**

Total number of pharmaceutical support staff

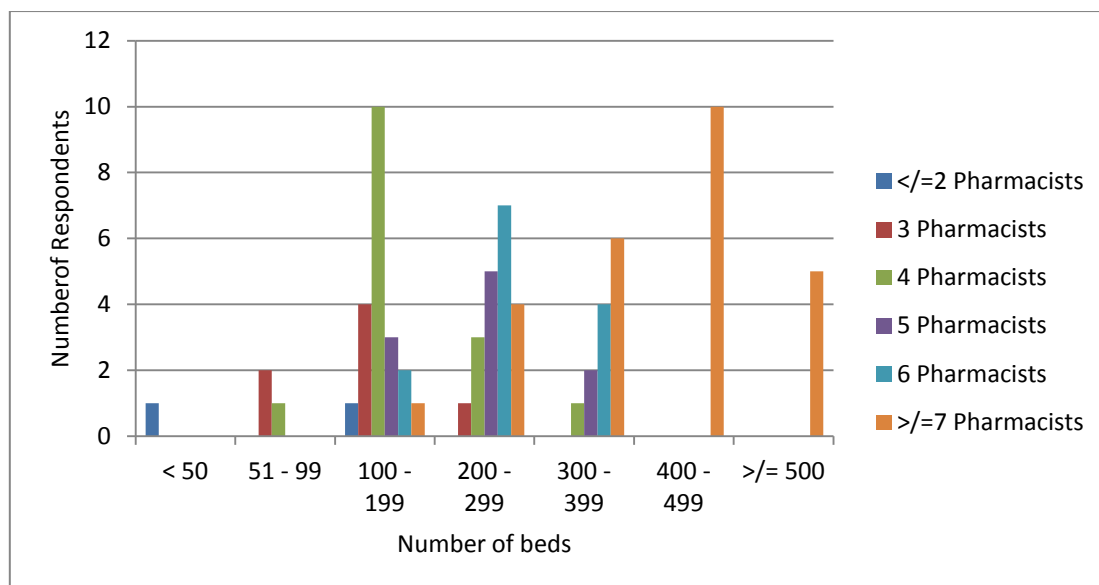
n = 73	<= 2	9	12.3
	3	2	2.7
	4	10	13.7
	5	8	11.0
	6	9	12.3
	>= 7	35	48.0

Total number of clinical/ward pharmacists

n = 73	0	8	11.0
	1	27	37.0
	2	14	19.2
	3	10	13.7
	4	7	9.6
	>= 5	7	9.6

---

When comparing hospital size to number of pharmacists, it can be seen that hospitals with 400 or more beds were staffed with at least 7 pharmacists (see Figure 4.2). In the 100 to 199 bed hospitals, 4 full-time employed pharmacists were most commonly identified as the staffing level. However, in hospitals with 200-299 beds, the number of full-time employed pharmacists varied from 3 to 7 or even more.

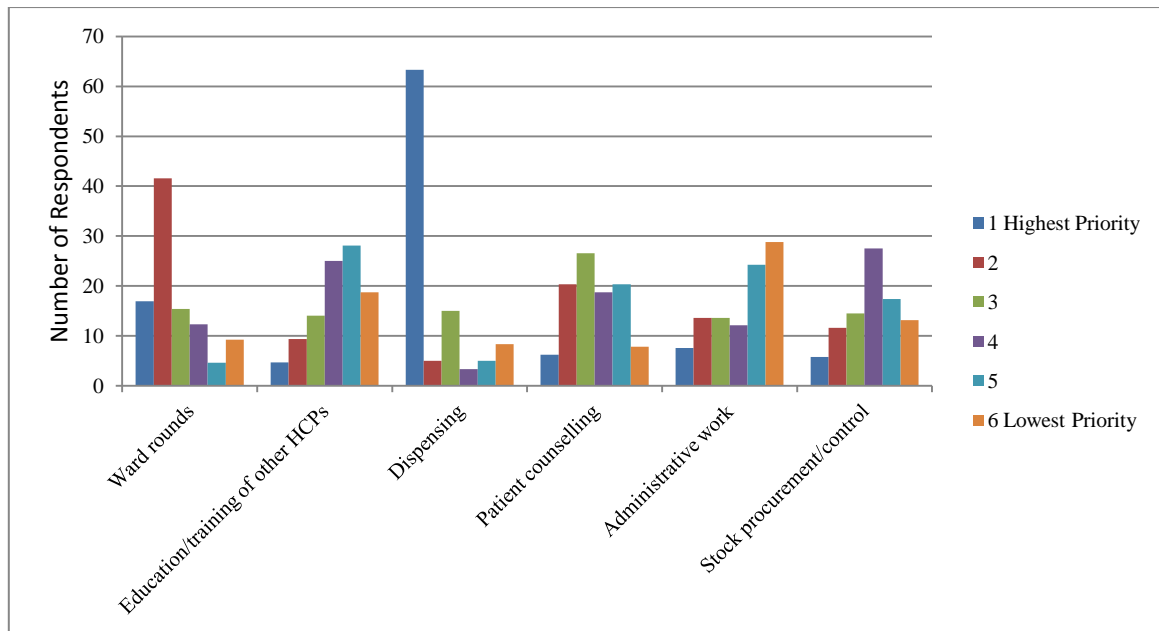


**Figure 4-2: Number of hospital pharmacists compared to hospital size**

Although a median of 2 (IQR: 1-3) clinical pharmacists were reported per hospital, 37% (27/73) of respondents stated that there was only 1 clinical or ward pharmacist appointed in their hospital (see Table 4.2). At least one clinical pharmacist was identified in all hospital size groups, and most clearly evident within the 100 to 199 and 200 to 299 bed hospitals. It can also be seen that 8/73 respondents (11.0%) noted that there were no clinical pharmacists present within their hospitals.

#### *4.3.6 Role of the pharmacist: Priority ranking of daily tasks*

The survey respondents were all asked to rank 6 daily activities, in the form of a Likert scale, according to what they considered the highest to lowest priority. The number of respondents that provided data for rating each activity varied from 60 to 69. The activities chosen were those most commonly performed within hospitals by pharmacy personnel. As can be seen in Figure 4.3, the two most noticeable activities rated in the highest priority scale (combined ratings of 1 and 2) were dispensing (41/60; 68.3%) and ward rounds (38/65; 58.5%). The three activities most commonly rated to be lower priority activities and falling within the lower priority scale (combined ratings of 5 and 6) were administrative work (35/66; 53.0%), education and training of other healthcare professionals (30/64; 46.9%) and stock procurement and control (28/69; 40.6%).

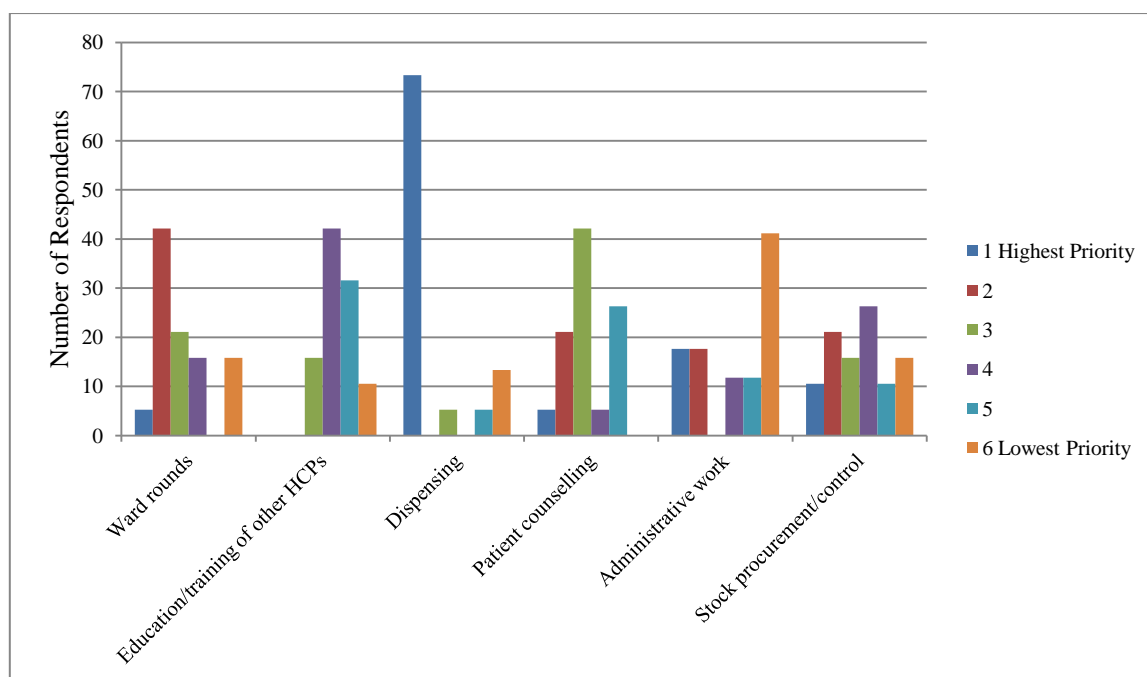


**Figure 4-3: Priority ranking of daily hospital pharmacist activities**

When asked what approximate percentage of time pharmacists spend daily on these 6 activities, respondents reported that dispensing and ward rounds are tasks that occupy most of the pharmacist's time. The median percentage of time that pharmacists spent on dispensing was reported to be 37.5% (IQR: 10-50%) with only 17.5% (IQR: 6.25-30%) of time is spent on ward rounds. The activities that occupied the least amount of time were stock procurement and control as well as education and training of other healthcare providers, both at a median of 5% (IQR: 5-10%).

Pharmacy managers made up 28.4% (21/74) of the total survey sample population (shown in Table 4.1) and due to the different daily tasks and requirements of this position, these responses were more closely analysed. The number of pharmacy manager respondents that provided data for rating each activity varied from 15 to 19. The 2 highest priority activities assigned to the pharmacy manager remained dispensing (11/15; 73.3%) and ward rounds (9/19; 47.7%) as shown in Figure 4.4. Only two activities were noticeably considered to have lower priority, these being administrative work (9/17; 52.9%) and education and training of other healthcare providers (8/19; 42.1%).





**Figure 4-4: Priority ranking of daily pharmacy manager activities**

The percentage of time that pharmacy managers specifically spend on these daily activities showed that the least amount of time is allocated to education and training of other healthcare professionals with a median of 5% (IQR: 5-10%). Patient counselling as well as stock procurement and control both had a median of 10% (IQR: 5-10% and 5-13.5% respectively) of daily time spent performing these tasks. A median of 50% of pharmacy manager's time is allocated to administrative work however this high value was not consistently recognized as variable responses are reflected in the large IQR (15-60%).

#### *4.3.7 Drug and Therapeutic Committee and Antibiotic Stewardship Committee involvement*

When the survey respondents were asked whether or not a DTC that regularly meet was present in the hospital, 55.4% (41/74) said yes, 37.8% (28/74) said no and 6.8% (5/74) did not respond, as is shown in Table 4.3. Looking closer at the hospitals with a DTC present, it was seen that at least one pharmacist was involved in this multidisciplinary committee. It was most frequently stated that 1 pharmacist (14/41; 34.1%) is currently involved in the DTC meetings within their hospital followed by 5 or more pharmacists (11/41; 26.8%).

In terms of an antibiotic stewardship, 91.9% (68/74) of survey respondents stated that there was an antibiotic stewardship programme implemented in their hospital and 87.8% (65/74) stated that there currently was an Antibiotic Stewardship Committee (ASC) that regularly meet within the hospital. Of the respondents that stated that there was an ASC currently in place, a minimum of one pharmacist

was a member of the multidisciplinary team. It was most frequently stated that 1 pharmacist (17/65; 26.2%) is involved within this committee.

**Table 4-3: Pharmacist involvement in DTC and ASC**

Parameter	Category	Number	%
Is there a DTC that regularly meet within your hospital			
n = 74	Yes	41	55.4
	No	28	37.8
	No response	5	6.8
Number of pharmacists currently involved in DTC.			
n = 69	0	9	13.0
	1	16	23.2
	2	7	10.1
	3	8	11.6
	4	3	4.4
	>= 5	11	15.9
	N/A	15	21.7
Number of pharmacists currently involved in DTC.			
(of the 41 respondents who stated that a DTC was present)	0	0	0
	1	14	34.1
	2	7	17.1
	3	6	14.6
	4	3	7.3
	>= 5	11	26.8
	N/A	0	0

**Table 4-3: Pharmacist involvement in DTC and ASC (continued)**

Is there an antibiotic stewardship programme currently in your hospital?			
n = 74	Yes	68	91.9
	No	1	1.4
	No response	5	6.8
Do you have an ASC that regularly meet within your hospital?			
n = 74	Yes	65	87.8
	No	5	6.8
	No response	4	5.4
Number of pharmacists currently involved in ASC.			
n = 69	0	1	1.5
	1	18	26.1
	2	15	21.7
	3	12	17.4
	4	7	10.1
	>= 5	14	20.3
	N/A	2	2.9
Number of pharmacists currently involved in ASC.			
(of the 65 respondents who stated that an ASC was present)			
	0	0	0
	1	17	26.2
	2	15	23.1
	3	12	18.5

**Table 4-3: Pharmacist involvement in DTC and ASC (continued)**

4	7	10.8
>= 5	13	20.0
N/A	0	0

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#### *4.3.8 Clinical pharmacy overview*

The survey respondents were asked to what extent they agreed or disagreed with statements related to clinical pharmacy as practised within private hospitals. The statements tested were derived from the thematic analysis conducted as part of the qualitative phase. Only 69 respondents provided data for this question. The responses are presented in Table 4.4 and Figure 4.5.

With reference to education and training it can clearly be seen that 100% (69/69) of the survey respondents, who answered this question, agreed (with 57/69; 82.6% strongly agreeing) to the statement that ‘Further formal education or training courses are required for pharmacists to provide efficient clinical pharmacy services’. It was also revealed that 94.2% (65/69) of the survey respondents also believed that it is the responsibility of the pharmacist to be primary providers of medication information and training to both doctors and nurses.

Multidisciplinary ward rounds can be considered an area of focus in building professional therapeutic relationships. Of all the survey respondents, 84.1% (58/69) completely agreed that with regular multidisciplinary ward rounds professional therapeutic relationships can be created and collaborative prescribing practices promoted within the hospital.

The idea of an increased responsibility being attributed to the clinical pharmacist for the patient’s clinical outcomes as a means to enhance clinical pharmacy services was agreed with by 87.0% (60/69) of survey respondents.

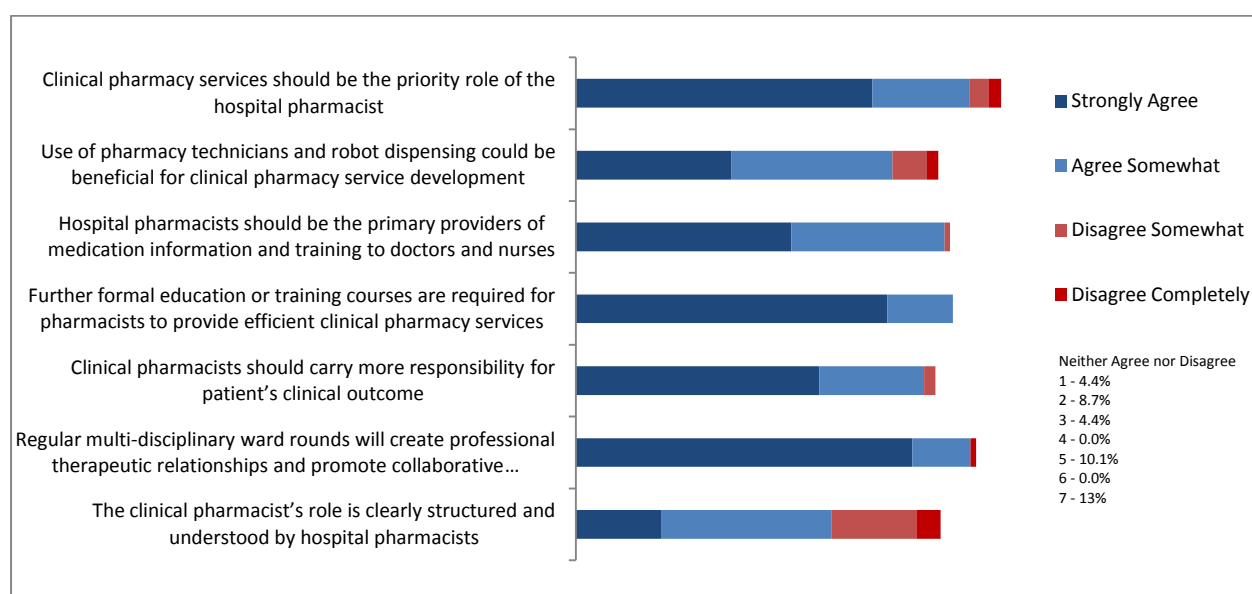
In terms of using dispensing aids as a means to enhance clinical pharmacy progression, 79.7% (55/69) of the survey respondents believed that the use of robot dispensing and technicians could to some extent be beneficial for clinical pharmacy service development within the hospital.

**Table 4-4: Level of agreement regarding statements related to clinical pharmacy**

Indicate your level of agreement with the following:	Agree fully (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Disagree completely (5)	Total responses
1. Clinical pharmacy services should be the priority role of the hospital pharmacist	46 (66.7%)	15 (21.7%)	3 (4.4%)	3 (4.4%)	2 (2.9%)	69
2. Use of pharmacy technicians and robot dispensing could be beneficial for clinical pharmacy service development	27 (39.1%)	28 (40.6%)	6 (8.7%)	6 (8.7%)	2 (2.9%)	69
3. Hospital pharmacists should be the primary providers of medication information and training to doctors and nurses	38 (55.1%)	27 (39.1%)	3 (4.4%)	1 (1.5%)	0 (0.0%)	69
4. Further formal education or training courses are required for pharmacists to provide efficient clinical pharmacy services	57 (82.6%)	12 (17.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	69
5. Clinical pharmacists should carry more responsibility for patient's clinical outcome	42 (60.9%)	18 (26.1%)	7 (10.1%)	2 (2.9%)	0 (0.0%)	69

**Table 4-4: Level of agreement regarding statements related to clinical pharmacy (continued)**

6. Regular multi-disciplinary ward rounds will create professional therapeutic relationships and promote collaborative prescribing practices	58 (84.1%)	10 (14.5%)	0 (0.0%)	0 (0.0%)	1 (1.5%)	69
7. The clinical pharmacist's role is clearly structured and understood by hospital pharmacists	14 (20.3%)	28 (40.6%)	9 (13.0%)	14 (20.3%)	4 (5.8%)	69



**Figure 4-5: Level of agreement regarding statements related to clinical pharmacy**

#### 4.3.9 The progression of clinical pharmacy

The survey respondents were further asked whether they felt that certain factors obtained during thematic analysis of the qualitative data would have a negative or positive effect on the progression of clinical pharmacy services as one of the primary roles of the clinical pharmacist. The number of respondents that provided data for each statement varied from 65 to 67. Their responses can be seen in Table 4.5 and Figure 4.6.

A large majority of the survey respondents (55/67; 82.1%) stated that the inclusion of post-graduate clinical courses will have a positive/somewhat positive effect on the progression of clinical pharmacy services as a primary role of the hospital pharmacist. Of the survey respondents, 56.9% (37/65) felt that their level of confidence in their own clinical knowledge was a hindering factor on the progression of clinical pharmacy services. It can be seen that 83.6% (56/67) of the survey respondents stated that influence and support from hospital management is a key factor that will enhance the progression of clinical pharmacy services in private hospitals.

Direct patient interaction and involvement at ward level was said to have, to some extent, a positive effect on clinical pharmacy service progression by 78.8% (52/66) of the survey respondents. It can also be seen that the level of understanding of the role of the clinical pharmacist as seen by other healthcare professionals (HCPs) is essential for the progression of clinical pharmacy services as one of the primary roles of the hospital pharmacist, with 71.6% (48/67) of the survey respondents in agreement. It was further recognized, by 77.6% (52/67) of the respondents, that support from other HCPs is also required to further the progression of clinical pharmacy services.

In reference to pharmacy operational factors, 76.1% (51/67) of the survey respondents felt that the current availability of time for clinical pharmaceutical services was a hindering factor towards the progression of clinical pharmacy services as one of the primary roles of the hospital pharmacist. It was further seen that the current staffing structure had a negative effect on clinical pharmacy service progression, with which 71.6% (48/67) of the respondents agreed.

With 70.8% (46/65) of survey respondents in agreement, it was identified that the introduction of a clinical pharmacist registration with the SAPC is vital to further progress clinical pharmacy services as one of the primary roles of the hospital pharmacist.

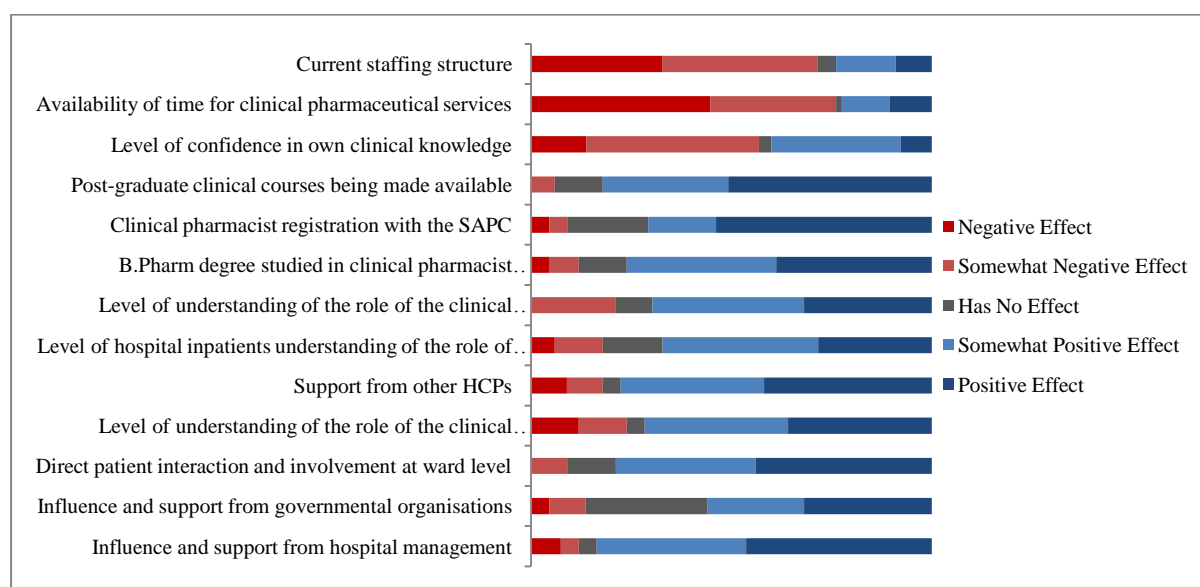
**Table 4-5: Direct effect of factors towards the progression of clinical pharmacy services**

<b>What effect do you feel the following factors have on progression of clinical pharmacy services as one of primary roles of the hospital pharmacist:</b>	<b>Negative effect (1)</b>	<b>Somewhat negative effect (2)</b>	<b>Has no effect (3)</b>	<b>Somewhat positive effect (4)</b>	<b>Positive effect (5)</b>	<b>Total responses</b>
1. Current staffing structure	22 (32.8%)	26 (38.8%)	3 (4.5%)	10 (14.9%)	6 (9.0%)	67
2. Availability of time for clinical pharmaceutical services	30 (44.8%)	21 (31.3%)	1 (1.5%)	8 (11.9%)	7 (10.5%)	67
3. Level of confidence in own clinical knowledge	9 (13.9%)	28 (43.1%)	2 (3.1%)	21 (32.3%)	5 (7.7%)	65
4. Post-graduate clinical courses being made available	0 (0.0%)	4 (6.0%)	8 (11.9%)	21 (31.3%)	34 (50.8%)	67
5. Clinical pharmacist registration with the SAPC	3 (4.6%)	3 (4.6%)	13 (20.0%)	11 (16.9%)	35 (53.9%)	65
6. B.Pharm degree studied in clinical pharmacist preparation at hospital level	3 (4.5%)	5 (7.5%)	8 (11.9%)	25 (37.3%)	26 (38.8%)	67
7. Level of understanding of the role of the clinical pharmacist	1 (1.5%)	14 (20.9%)	6 (9.0%)	25 (37.3%)	21 (31.3%)	67
8. Level of hospital inpatients understanding of the role of the clinical pharmacist	4 (6.0%)	8 (11.9%)	10 (14.9%)	26 (38.8%)	19 (28.4%)	67
9. Support from other HCPs	6 (9.0%)	6 (9.0%)	3 (4.5%)	24 (35.8%)	28 (41.8%)	67
10. Level of understanding of the role of the clinical pharmacist as seen by other HCPs	8 (11.9%)	8 (11.9%)	3 (4.5%)	24 (35.8%)	24 (35.8%)	67



**Table 4-5: Direct effect of factors towards the progression of clinical pharmacy services (continued)**

11. Direct patient interaction and involvement at ward level	0	6 (9.1%)	8 (12.1%)	23 (34.9%)	29 (43.9%)	66
12. Influence and support from governmental organisations	3 (4.6%)	6 (9.1%)	20 (30.3%)	16 (24.2%)	21 (31.8%)	66
13. Influence and support from hospital management	5 (7.5%)	3 (4.5%)	3 (4.5%)	25 (37.3%)	31 (46.3%)	67
14. Other? Please specify*	<ul style="list-style-type: none"> <li>open communication channels between healthcare professionals and respect for the different healthcare professions among health care professionals</li> <li>The current focus on Antibiotic Stewardship (only) is having a negative effect on the Clinical Pharmacy as patients are not evaluated holistically but only antibiotic medication are reviewed and evaluated.</li> <li>BPharm does not sufficiently prepare pharmacists for a role in clinical pharmacy. It is very science based and does not provide the pathophysiological and disease management background for clinical pharmacy requirements</li> </ul>					



**Figure 4-6: Direct effect of factors in support of the progression of clinical pharmacy services**

#### *4.3.10 Additional comments on the barriers to clinical pharmacy progression and possible ways to overcome them*

The survey respondents were further asked if there were any other factors they felt were hindering clinical pharmacy progression and if they had any suggestions for possible solutions. All respondents were coded as R1 to R74 for reference.

In terms of education and training, respondent R53 stated:

*“I think more ‘in-house’ CPD’s and training would be beneficial for all pharmacists who are required to participate in clinical services.”*

Another respondent (R12) also stated that online and interactive short courses should be made available to give hospital pharmacists the opportunity to pursue clinical work without having to complete a post-graduate degree (which, due to financial constraints or family obligations, may not be a possibility). The lack of a residency type program where newly qualified clinical pharmacists can learn from experienced clinical pharmacists through a practical approach was mentioned by respondent R7 as a barrier to clinical pharmacy progression in South Africa.

Respondent R25 mentioned that there is inconsistency between the different hospitals of the group in the amount of clinical work the pharmacist is able to do. This is due to some hospitals having a number of clinical pharmacists while others have no pharmacists in a specific clinical pharmacist position:

*“Pharmacists are employed in a dispensing position and then do ward/clinical work as a small fraction of their job.” (R25)*

Another respondent (R7) stated that:

*“Clinical pharmacists are spread between different private and public hospital groups with different visions for clinical pharmacy.”*

This lack of direction, or common goal for clinical pharmacy, is hampering its progression in the country.

Lack of incentive and motivation was also mentioned as a potential barrier to clinical pharmacy within private hospital. Respondent R41 suggested that if legislation could change, whereby a professional fee could be charged to inpatients or on the medication dispensed within the hospital for

all “behind the scenes” services that are rendered, this could enable employers to employ a pharmacist to specifically offer clinical services. Clinical pharmacy could in turn be expanded to all inpatients. The behavioural factors commonly hindering pharmacists from taking up the clinical pharmacy role was emphasized by respondent R43:

*“The progression of clinical pharmacy services is based entirely on a pharmacist[‘s] willingness to learn and change.”*

#### **4.4 Summary**

This study investigated the views and attitudes of pharmacy managers and hospital pharmacists towards clinical pharmacy and the barriers to its progression in the private hospital environment. Key informant interviews and the subsequent thematic analysis thereof exposed these hindering factors as external structural factors and internal behavioural factors. The external factors, being out of the pharmacist and pharmacy manager’s control, could be grouped into educational factors, pharmacy operational factors and hospital and governmental influence. The internal factors considered to be individualized and under the pharmacist’s control, incorporated their self-confidence and attitude towards change.

The structural and behavioural themes analysed during the first phase of this study allowed for the development of a quantitative survey tool to further explore these factors and their influence on clinical pharmacy progression. Hospital pharmacists of clinical, dispensing and managerial background gave insight into the level of clinical pharmacy within the private setting and to what extent these factors are hindering its progress. The significance of these findings within the South African setting and how they compare to similar studies conducted in other countries will expose areas in which remedial action can be taken. The first step in advancing the development of clinical pharmacy services and the recognition of the pharmacist as a clinical partner in improving patient care outcomes depends primarily on identifying methods to overcome these barriers.

## Chapter V: Discussion

The factors hindering the progression of clinical pharmacy in private hospitals in South Africa consist both of internal factors, such as the individual pharmacist's attitude towards change, and external factors, which are often out of the pharmacist's control. This chapter discusses all the perceived barriers to clinical pharmacy services in the South African private hospital sector identified in the study, places these in the context of the available literature, and suggests ways in which these barriers could be overcome. The chapter also discusses the use of the FIP Basel Statements on the Future of Hospital Pharmacy as a tool for monitoring clinical pharmacy progression within the hospital sector.

The perceived barriers, and the means to address them, were elucidated in exploratory interviews with pharmacy managers from a single, large private hospital group in South Africa, and then confirmed and quantified by means of a survey among pharmacists in the same group.

### 5.1 Educational needs and self-confidence

The provision of clinical pharmacy services as a non-distributory or non-dispensing role of the private hospital pharmacist faces several hindering factors, and the pharmacists' lack of clinical knowledge is one most commonly identified. In the quantitative portion of the study, all the survey respondents agreed with the statement that '*Further formal education or training courses are required for pharmacists to provide efficient clinical pharmacy services*'. The need to provide clinical training and further develop the clinical knowledge of hospital pharmacists is essential in effectively establishing and maintaining this role.

The lack of appropriate and applicable clinical knowledge, as a barrier to clinical pharmacy progression, has been revealed in studies conducted in other low- and middle-income countries.<sup>12,32,62</sup> Kheir *et al.* conducted a review of the literature related to pharmacy education and practice in 13 countries in the Arabic-speaking traditional Middle Eastern region.<sup>62</sup> They identified a need to restructure pharmacy undergraduate curricula to focus more on the provision of patient care skills through experiential training, in order to provide the clinical knowledge that the expanding role of the pharmacist demands.<sup>62</sup> In an attempt to provide more clinically advanced professionals, several pharmacy schools in these countries have introduced PharmD programmes as entry-level qualifications.<sup>62</sup> These countries have sought accreditation with the US Accreditation Council for Pharmacy Education (ACPE), and have chosen to align their pharmacy curricula with the US model, rather than the British model inherited from their colonial past. Penm *et al.* conducted a qualitative

research study into the factors directly affecting clinical pharmacy service implementation in Chinese hospitals.<sup>12</sup> Hospital administrators, pharmacy directors, clinical pharmacists and dispensing pharmacists from 29 tertiary and secondary hospitals in different areas of China were interviewed. One of the barriers to clinical pharmacy identified in this study was the negative effect a lack of clinical knowledge had on the pharmacist's self-confidence.<sup>12</sup> Respondents felt that the amount of clinical training received was inadequate to prepare pharmacists for clinical roles. Added to this, a limited number of training positions were offered for clinical pharmacists in China, resulting in many pharmacists being unable to upgrade their skills as required.<sup>12</sup> The study by Penm *et al.* drew attention to multiple other factors affecting clinical pharmacy progression in Chinese hospitals. As both China and South Africa are upper middle-income countries, these comparisons have been explored more extensively in this chapter.

A study conducted by Ngorsuraches and Li in 2006 determined the perceived barriers and attitudes of pharmacists to providing pharmaceutical care services in Thailand, another upper middle-income country, through a self-administered questionnaire.<sup>63</sup> This study was not restricted to the views of hospital pharmacists as community sector pharmacists were also included. However, 83.4% of the respondents in this study were from the hospital sector. One of the major barriers to pharmaceutical care revealed was a lack of therapeutic knowledge and clinical problem-solving skills of the pharmacist and a lack of confidence in providing pharmaceutical care as a service.<sup>63</sup>

One potential determining factor of the degree to which pharmacists feel confident to deliver clinical services is their initial professional education and training. The pharmacy undergraduate degree differs considerably between medium- and high-income countries, where clinical pharmacy is more established. The ACPE has endorsed the PharmD degree as the entry-level requirement for practising pharmacists in that country. Over time, this has replaced all baccalaureate level qualifications in the US. Although commonly perceived as a 6-year qualification, many PharmDs are 4-year graduate programmes, which enroll students who already hold a college degree. Importantly, though the first 3 years of most PharmD programmes include the usual foundational courses in the Pharmacy majors, they also include introductory experiential learning opportunities in Pharmacy Practice. The final, 4<sup>th</sup> year of the PharmD programme is usually an advanced pharmacy practice experience, with extensive exposure to healthcare settings, and in particular to the teaching hospitals to which Pharmacy Schools in the US are affiliated. In addition, it has become increasingly common for hospital pharmacists in the US to have completed a 1- or 2-year residency program, leading to board certification as a pharmacy specialist.<sup>47,48</sup> In the United Kingdom (UK), as in the rest of Europe, the Bologna-inspired harmonisation of professional education has seen the introduction of a 4-year integrated MPharm programme.<sup>50</sup> After completion of the MPharm, UK graduates still complete a year of pre-registration

experience. It must be emphasised that the UK schooling system requires 13 years to complete the Advanced (A) level qualification on which university entrance is based, compared to the 12 years to complete the National Senior Certificate in South Africa. A 4-year MPharm is thus the equivalent of a 5-year qualification in South Africa. In many European countries, such as France and The Netherlands, the PharmD is now commonly offered. In The Netherlands, designation as a hospital pharmacist requires the completion of a post-graduate qualification, beyond the entry level qualification, and formal certification. In many Dutch teaching hospitals, this training is sometimes linked to a structured doctoral programme, leading to a PhD qualification. In an attempt to provide more clinically advanced professionals, the introduction of the PharmD programme as an entry-level qualification is increasingly seen in low- and middle-income countries, such as India, Pakistan, Bangladesh and parts of the Middle East.<sup>64</sup> Clinical pharmacy progression in these countries have, however, been challenged by the shortage of qualified clinical pharmacists to act as preceptors of mentors.<sup>64</sup>

In South Africa, the 4 year BPharm undergraduate degree has replaced the Diploma in Pharmacy as the qualification leading to professional registration. However, another year of pre-registration internship has to be completed in the community, institutional (hospital), industrial or academic setting, during which time the final qualifying examination set by the South African Pharmacy Council has to be successfully completed. After registration as a pharmacist, graduates who have completed the internship and final qualifying examination also have to complete a further year of community service in the public sector, before being able to practice in a setting of their choosing. Although providing some experience in an institutional setting (usually a hospital, although some community service pharmacists are also placed in primary care facilities, provincial stores, military or correctional services facilities, or even, most recently, at the national medicines regulatory authority), the community service year is not intended to be part of the training of a pharmacist. Therefore, all that is required for a pharmacist to practise within the public or private hospital sector is completion of the BPharm, an internship in any setting and the final qualifying examination (which is partly specific to the setting in which the internship was completed). As respondent PM 1 mentioned during the interview session, the clinical knowledge that a new pharmacy graduate obtains during the undergraduate degree tends to not be enhanced or applied during the community service year as the work performed is often more focused on stock procurement and logistic tasks as opposed to clinical work. In the South African model, as in many other low- and middle-income countries, the perceived health care need (primarily seen in the public sector) is to run safe and effective medication distribution systems, rather than the provision of sophisticated clinical pharmacy services.<sup>32</sup> The undergraduate degree often accommodates needs-based education models to supply professionals competent in meeting the primary needs of the community and profession, rather than the future needs

of more developed practice.<sup>65</sup> Only once these priorities are being met, can adaptation of the pharmacy programme to incorporate global views be considered.<sup>65</sup> The FIP, in its global vision for education and workforce published in 2016, acknowledged that a needs-based, outcomes-focused approach to continuing education and training should be the foundation of pharmaceutical workforce development.<sup>66</sup> The FIP has stated that “[a]n evolving pharmaceutical workforce is one that can adapt its core roles and responsibilities to meet the new and emerging needs of patients and civil society.”<sup>66</sup> As the demand for pharmaceutical care focused services is becoming more evident, and pressing, in South African private hospitals, the local pharmacy curricula need to adapt to supply professionals capable of meeting this demand. Relying on the few South African pharmacists who have completed post-baccalaureate PharmD or clinical pharmacy MPharm programmes in the US, UK and elsewhere will not suffice. The necessary capacity must be home-grown, and appropriate to the needs of local practice, at the requisite level of clinical sophistication.

The introduction of post-graduate clinical pharmacy courses, as suggested by respondent PM 4, was supported by 82.1% of the survey respondents. The lack of clinical knowledge as a barrier and the need for further structured courses to provide competent clinical pharmacists has also been recognised in other low- and middle-income countries. A study conducted by Penm *et al.*, on factors affecting the implementation of clinical pharmacy services in China, found that many clinical pharmacists agreed that the current training model used in China was considered “insufficient or inappropriate to implement”.<sup>12</sup> However, in South Africa, the introduction of such course, leading to a specialist registration as a clinical pharmacist has followed a contested and protracted course. The proposed amendment to the “Regulations relating to the registration of persons and the maintenance of registers” for inclusion of registration as a clinical pharmacist is still pending approval.<sup>42</sup> The Board Notice 152 of 2014, issued by the South African Pharmacy Council, expresses the need for a specific, newly-designed and extensive post-graduate Master of Pharmacy qualification as the minimum requirement for registration as a clinical pharmacist.<sup>42</sup> There is no acknowledgment of existing post-graduate MPharm or even post-baccalaureate PharmD qualifications, or of clinical courses/training that may already have been undertaken by hospital pharmacists, which might constitute the grounds of recognition of prior learning (RPL).

Before any overly restrictive methods for registration as a clinical pharmacist are implemented, a more inclusive approach to incorporate prior clinical training and education should be considered. The Board of Pharmacy Specialties (BPS) is an independent structure, established in 1976 by the American Pharmacy Association, focused on providing post-licensure specialty certification to the pharmacy profession.<sup>67</sup> The BPS certification provides a means for qualified pharmacists to voluntarily complete a competency assessment, in their chosen speciality area, that is based on

rigorous peer-developed standards.<sup>43</sup> Recertification is required every seven years to ensure that the knowledge and skill of the pharmacist is maintained at a high level. BPS certification “enables pharmacists to differentiate and affirm their knowledge and skills to provide more comprehensive patient care; be prepared to step into pharmacy’s evolving position on the integrated multidisciplinary treatment team; and be recognized for their expertise by healthcare professionals, employers, insurers and patients”.<sup>67</sup> Currently there are eight pharmacy practice specialties offered by the BPS, these being: ambulatory care pharmacy, critical care pharmacy, nuclear pharmacy, nutritional support pharmacy, oncology pharmacy, paediatric pharmacy, pharmacotherapy and psychiatric pharmacy.<sup>67</sup> A certified system of clinical knowledge assessment based on the educational requirements attributed to the clinical pharmacist role, along with a structured process of recertification, will be a beneficial alternative to the post-graduate degree as the sole minimum requirement for clinical pharmacist specialist registration in South Africa.

As the proposals for clinical pharmacist registration in South Africa are still in draft form, and have yet to get the explicit support of the Department of Health or the Minister, the formalisation of the proposed clinical pharmacy speciality qualification and register is likely to be delayed. Both public and private sector hospitals are therefore unlikely to see the provision of a supply of qualified registered clinical pharmacists for some years. As a result, the need to follow international educational trends and restructure the undergraduate degree for pharmacists has been recognised, as a means of ensuring that those entering the hospital environment are competent to provide standardised and adequate clinical pharmacy services. Respondents PM6 and R12 mentioned that financial constraints and family obligations hinder further post-graduate study for those entering the working environment. However, a separate post-graduate degree would provide a bridging option for those currently in the field to pursue the title and registration and should be provided until undergraduate supply meets future demand.

In the interim, until a structured clinical pharmacist course is established, other methods of training were suggested by the respondents in this study. The need to specialise was a concept suggested to aid the progression of clinical pharmacy services. As mentioned by PM 7: “*Specialising will empower the pharmacist to study further and to give them accountability and responsibility. The doctor will now have a ‘go to’ person for a specific field of medicine.*” To specialise or to adopt an integrated model to provide continuity of care, a model used by 64.7% of US hospitals in 2009,<sup>68</sup> is important to consider if specialised models and training are to be implemented. For example, it was found that clinical pharmacists in China were unsure of their responsibilities as a specialist pharmacist and found being a generalist pharmacist more useful.<sup>12</sup> Pharmacists need more focus on improving their skills in



particular roles, such as the provision of pharmacokinetic advice, as mentioned by PM 4, as the advisory role of the pharmacist is poorly developed in South African hospitals.<sup>14</sup>

Antibiotic stewardship in South Africa is following global trends to combat the spread of antibiotic resistance, and its implementation has been particularly marked in the private hospital sector.<sup>40</sup> This has allowed hospital pharmacists to engage with a non-distributory, more specialised clinical role in patient care.<sup>40</sup> Branching out and adopting other similar roles will aid the progression of clinical pharmacy, provided clinical training along with regular modules and testing (as suggested by PM 2) are in place to ensure the pharmacists' knowledge remains at a high standard. Performance- or competency-based criteria have been used internationally to aid in clinical pharmacy progression and should be considered within the hospital group.<sup>12</sup> Survey respondent R53 also mentioned the importance of continuing professional development (CPD): *"I think more 'in-house' CPD's and training would be beneficial for all pharmacists who are required to participate in clinical services"*. CPD training modules and programmes should be promoted within the hospital group to ensure the level of clinical knowledge of the hospital pharmacist is raised and that it is current and evidence-based. The FIP has recently highlighted the importance of CPD systems as an essential means of "maintaining and advancing the competencies and capabilities of pharmacists and pharmaceutical scientists throughout their careers".<sup>66</sup>

Poor self-confidence in providing clinical services is closely linked to the pharmacists' lack of clinical knowledge and training, with 56.9% of the survey respondents agreeing that their level of confidence in their own clinical knowledge was a hindering factor to the progression of clinical pharmacy services. Poor self-confidence is also linked to uncertainty and lack of clear understanding of their new role. The South African hospital pharmacist is entering a transition period and the progression of this new clinical role is dependent largely on how the pharmacist can adapt to this change, given the other external barriers to clinical pharmacy progression. As respondent R43 mentioned: *"The progression of clinical pharmacy services is based entirely on a pharmacist[s] willingness to learn and change"*.

## 5.2 Resource allocation for clinical pharmacy progression

A lack of available time for clinical work, linked to current staffing levels and staff structure requirements, was identified as a key barrier to clinical pharmacy services in South African private hospitals. Pharmacy is considered to be a scarce skill occupation in South Africa. WHO global observational surveys indicated that, in 2012, there were 0.413 pharmacists per 1000 population in South Africa, compared to the 0.812 and 1.016 pharmacists per 1000 population in the UK and

Australia, respectively.<sup>34</sup> Both the UK and Australia are high-income countries, whereas South Africa is an upper middle-income country. The number of pharmacists in other upper middle-income countries according to the WHO global observational surveys in 2011 was 0.269 and 0.354 pharmacists per 1000 population in China and Turkey, respectively.<sup>34</sup> There are currently 13 981 registered pharmacists in South Africa.<sup>20</sup> In 2012, 43% of the pharmacists on the register were employed in the community pharmacy sector, followed by 35% in hospital settings.<sup>69</sup> There is already a need to meet the medication distribution demands of the community with low pharmacist numbers, and as it was mentioned by PM 7, the priority role of the pharmacist in many hospital settings is inpatient dispensing which takes precedence over clinical services. The shortage of pharmacists was also a factor seen as affecting clinical pharmacy service implementation in China.<sup>12</sup> When it comes to assigning resources in smaller hospitals, tasks considered to be of lower priority (e.g. DTC meetings and clinical work) are not regularly met, as pharmacists are allocated preferentially to what are perceived to be higher priority roles, and in particular medication distributive roles. The lack of human resources also affects high-income settings. For example, the 2015 American Society of Health-System Pharmacists (ASHP) national survey showed that only 44.6% of US hospitals with fewer than 50 beds provided drug therapy management to patients compared to 85.3% of hospitals with 600 or more beds.<sup>70</sup> The lack of time to provide pharmaceutical care services was also a barrier perceived by pharmacists in Thailand.<sup>63</sup>

The survey respondents revealed that dispensing was considered to enjoy the highest priority for pharmacists in private hospitals, followed by ward rounds. It was further shown that most of the pharmacists' time was allocated to these high priority tasks: dispensing (37.5%) and ward rounds (17.5%), while only 5% of time is spent on education and training as well as on stock procurement/control. According to the 2015 ASHP national survey, 43.8% of the US hospital pharmacists' time was spent on order review and verification (medication order or prescription review and verification forms part of dispensing process) and only 23.6% was dedicated to clinical functions.<sup>24</sup>

To determine the ideal staffing structure and staffing levels required per hospital to provide sustainable clinical pharmacy services without negatively affecting medication dispensing services is difficult. It was suggested by respondent PM 5 that staffing models should be based on hospital-specific statistics, such as the number of hospital beds, and the time required per patient to provide the desired clinical services. While the first piece of data is easily obtained, the second depends on the types of beds, case mix, and the specific services to be delivered, and is very difficult to determine with any accuracy. With a median of 6 pharmacists and 2 clinical pharmacists per hospital within the group, and 37% of respondents stating there was only 1 clinical pharmacist present, the task of

providing clinical services to meet the pharmaceutical care needs of all patients appeared to be impossible. In this regard, the contrast with US data is informative. The 2015 ASHP national survey showed that the average number of pharmacist full-time equivalents (FTE) was 11.4 per hospital, with an additional 11.0 FTE pharmacy technician per hospital. Pharmacist and technician FTEs varied with hospital size.<sup>24</sup> Across all US hospitals surveyed, there was an average of 15.6 pharmacist FTEs and 14.8 pharmacy technician FTEs per 100 occupied beds.<sup>24</sup> In South Africa, the idea of 30 pharmacists and 30 pharmacist's assistants (post-basic) per 200-bed hospital (with 100% bed occupancy) seems fanciful to say the least. In Canadian hospitals the idea of capping the number of patients under the care of the clinical pharmacist has been suggested, however this has received both positive and negative opinions to its proposed implementation.<sup>30</sup> It was also mentioned by respondent PM 2 that clinical pharmacists need not be involved with every patient, and that the perceived pharmacist workload could be addressed by up-skilling nursing staff. Working in collaboration with nurses the clinical pharmacist work can be targeted to patients at greater risk of medication-related problems while still providing some degree of medication therapy service and counselling to all patients within the hospital.

Hawthorne and Anderson conducted a systematic review study of the global pharmacy workforce, and identified the most common responses to the ever-increasing demand for pharmacists as the "increased use of technology, expansion in the number and roles of pharmacy technicians and increased numbers of pharmacy graduates".<sup>35</sup> In the 2015 ASHP national survey it was found that only 18.2% of the pharmacists' time was spent on drug distribution, a task taking up 77.5% of pharmacy technicians' time.<sup>24</sup> The expanded use of pharmacy technicians has been widely accepted in high-income countries in order to enhance patient-oriented pharmacy services by reducing the need for pharmacist involvement in time-consuming distributive tasks.<sup>35,47</sup>

The norm in US hospital pharmacies is a technician:pharmacist ratio of 2:1.<sup>47</sup> In South Africa, pharmacy support staff primarily consists of pharmacist's assistants, either qualified at the basic or post-basic level. Currently there are just fewer than 19 000 pharmacist's assistants registered with the SAPC, including those still in training.<sup>20</sup> The quantitative survey revealed that there was a median of 6 pharmacy support staff per hospital with 48% of respondents working in hospitals with 7 or more pharmacy support staff. However, this might have included clerical staff employed in the pharmacy who are not registered with the Pharmacy Council, even though the questionnaire specifically asked about pharmaceutically-trained staff. Training for pharmacy technicians in South Africa has recently begun. However there is not yet a separate register for pharmacy technicians and they are currently required to perform the duties of pharmacist's assistants (post basic).<sup>44,46</sup> Further structuring, clarity

and recognition of the pharmacy technician's role in the private health care sector in South Africa are needed to determine their future role in aiding clinical pharmacy progression.

### 5.3 Technology to aid clinical pharmacy development

The use of automated dispensing units was mentioned by multiple respondents as a method for overcoming barriers to clinical pharmacy service progression due to lack of human and other resources. Respondent PM 5 stated: *"Probably one of the only other ways forward is when you start automating. Looking at a cost effective way of staffing and resourcing, probably automated dispensers are the only way to go."* Survey respondents agreed that the use of automated dispensing units and pharmacy technicians would be beneficial for clinical pharmacy service development. The 2014 ASHP national survey showed that 97% of all US hospitals that responded have automated dispensing cabinets incorporated in the hospitals medication distribution systems.<sup>23</sup> The use of automated dispensing environments has helped pharmacists to dispense medication more efficiently. However, when it comes to prescription management and monitoring, a reduction in pharmacist numbers and hours has not yet been seen.<sup>47</sup>

In terms of technology advances focused on medication safety in US hospitals, the ASHP national survey revealed that 97.5% of all hospitals surveyed used complete or partial electronic health record systems, 93.7% incorporated barcode-assisted medication administration and 84.1% of hospitals used computerised prescriber-order-entry (CPOE) systems.<sup>24</sup> Bar-code electronic medication-administration system (Barcode eMAR) is focused on reducing medication administration errors (including timing errors and potential adverse drug events) by making certain that the right patient receives the right medication at the right dose and at the right time, based on a medical practitioner's prescription order, but after it has been approved electronically by the pharmacist.<sup>71</sup> South African private hospitals have incorporated electronic patient medication records and medication labelling is computerised, however computerised medical practitioner prescribing software is not common and paper-based medication ordering or prescribing is more commonly used.<sup>14</sup> Computerised patient medication records in South African private hospitals are geared largely to billing purposes and are not fully integrated with other electronic patient-related systems in the hospital, such as those for laboratory or radiological data or for the recording of clinical and nursing service provision.<sup>14,72</sup> There is also a need for integration of this type of electronic patient-related medication recording platform across individual institutions, both within the group and across different private hospital groups, to build comprehensive patient medical profiles that can be accessed at different points of care. Investing in CPOE and Barcode eMAR type systems will extend the approach to ensuring medication safety that is practised in private hospitals by helping to eliminate potential medication administration errors.

The continuous recording of prescribing and administration data will also aid in drawing attention to potential areas where processes could be improved, often not an easily achievable task using labour intensive paper-based systems.

Using software, as mentioned by respondent PM 5, has helped to get hospital pharmacists to approach a clinical environment with purpose and perform duties outside of dispensing. A key example in the South African setting has been the investment by one of the private hospital groups in the Bluebird software suite (<http://www.intelms.com/ams.html>),<sup>73</sup> a prospective antimicrobial auditing tool that is able to build a patient electronic medical record by extracting information on antimicrobials used and laboratory data received in real time. This software allows the clinical pharmacist to audit target antimicrobials, access laboratory information and record interventions. The growing focus in private hospitals in South Africa, following global concern, has been on antimicrobial stewardship and this is reflected in the perceived need for and importance accorded such tools.<sup>72</sup>

#### 5.4 The need for Governmental and Hospital support

A major barrier to clinical pharmacy progression in South African hospitals cited by respondents is the lack of registration of clinical pharmacy as a speciality category and the need for the SAPC to recognise, establish and clearly define the role of the clinical pharmacist. As respondent PM 7 noted: *“Government needs to define the roles of clinical pharmacists clearly”*. The inclusion of the clinical pharmacist as a speciality category was proposed by the SAPC in December 2014 but has not yet been finalised.<sup>42</sup> Clinical pharmacist registration was agreed with by 70.8% of survey respondents as a vital step in clinical pharmacy progression in the country. Along with defining the role of the clinical pharmacist, it is also important to establish the responsibilities attributed to this new role. Survey respondents agreed that an increased responsibility attributed to the clinical pharmacist for the patient’s clinical outcome will enhance clinical pharmacy services.

Once the role has been established, a national clinical pharmacy programme must be implemented for both public and private sectors. It was mentioned by respondent PM 6 that for clinical pharmacy to progress, it should be nationally driven and not divided as each hospital group pursues their own idea of what clinical pharmacy should entail. Respondent R7 agreed: *“Clinical pharmacists are spread between different private and public hospital groups with different visions for clinical pharmacy.”*

A nationally implemented clinical pharmacy programme could overcome the perceived barrier of uncertainty about the role of the clinical pharmacist as viewed by other health care professionals and patients, as the role will be more clearly defined and promoted. Respondents mentioned that medical

practitioners and nurses do not see clinical pharmacists as contributing to patient outcomes but merely as dispensers of medication. The lack of recognition of the role of and need for the clinical pharmacists is also seen in other low- and middle-income countries.<sup>32</sup> A qualitative study conducted by Morecroft *et al.* in three National Health Service (NHS) general hospitals in England showed the lack of inpatients' awareness of the hospital pharmacist's contributory role in patient care.<sup>74</sup> These authors conducted semi-structured interviews with 74 inpatients from the acute medical wards and found that 57% of all participants had no expectation of seeing a pharmacist at ward level during their stay and were actually surprised to see pharmacists outside of their traditional dispensing role.<sup>74</sup> It was found, however, that 65% of patients felt that the pharmacist, compared to other health care professionals, was actually more approachable with regard to medication-related issues. However, due to a lack of insight into the clinical role of the pharmacist, outside of medication distribution and dispensing, the patients' expectation of the pharmacist for any greater contribution to patient care was not evident.<sup>74</sup> Added to the need for continuous promotion of clinical pharmacy services within the community, Morecroft *et al.* mentioned that pharmacists simply need to introduce themselves at the bedside and provide a leaflet indicating their role with a means of being contacted, to aid further development of the clinical pharmacist services in patient care.<sup>74</sup> Lack of patient understanding of the role of the clinical pharmacist was also identified as a barrier for clinical pharmacy progression by Penm *et al.*<sup>12</sup> Patient education and counselling through increased pharmacist exposure to the ward environment will aid in overcoming this barrier to clinical pharmacy progression. This type of remedial strategy was also suggested by Penm *et al.*, who noted that regular education and counselling of the patient's medication would aid in their understanding and acceptance of the role and responsibilities of the clinical pharmacist.<sup>12</sup> Respondent PM 5 mentioned that the role of the clinical pharmacist will eventually be understood by patients through the education of nurses and medical practitioners, who would then reinforce this view with their patients.

Governmental and hospital management support are critical for the progression of clinical pharmacy services. Survey respondents stated that influence and support from hospital management as well as from other health care professionals is important. As clinical pharmacy is in its infancy stage in South Africa, the invested benefits within hospitals on patient clinical outcome will not be seen immediately, but with the introduction of antibiotic stewardship programmes in private hospital, the benefits of hospital pharmacists providing more clinical, non-distributive services are being noticed.<sup>40</sup> The need for governmental and hospital administrative support for clinical pharmacy progression was also seen in Chinese hospitals.<sup>12</sup> Penm *et al.* suggested that clinical pharmacists should promote clinical pharmacy services in China, together with hospital administration, and that the clinical pharmacist should be actively involved in conducting research to improve systems. These authors also re-emphasised the importance of clinical pharmacists' role to hospital administrators as well as

prescribers and patients.<sup>12</sup> Motivation, incentive and lack of clear career path for clinical pharmacists, as mentioned by respondents, also hinder clinical pharmacy progression. Retaining pharmacists who pursue further qualifications and training is a challenge.

Respondents mentioned that one of the other problems facing clinical pharmacy progression is the fact that, in the South African private hospital sector, medical practitioners are not under the employ of the hospital and practise in their own private capacity. Respondents mentioned that, due to this arrangement, medical practitioners tend to follow their own protocols and guidelines, can prescribe whatever they want without restriction, and take full accountability for patient's clinical outcomes, thus reducing the opportunities for a multidisciplinary approach to patient care. Internationally, a recent push by US hospitals in employing primary care physicians has been seen.<sup>75</sup> The Medical Group Management Association showed a nearly 75% increase in the number of active doctors employed by US hospitals since 2000. The move to hospital employment in the US is seen more with young practitioners, who value the more structured work-life balance, lifestyle flexibility and administrative simplicity seen in hospital employment over a higher income incentive.<sup>75</sup> The process of implementation of National Health Insurance (NHI) within South Africa might be seen as a way to entrench similar trends, but is expected to take up to 14 years to complete.<sup>14</sup> The approach to and movement of medical practitioners within the country with regards to hospital employment will be of interest when this system is implemented nationally.

It is important to approach and build therapeutic relationships with medical practitioners and the use of Drug and Therapeutics Committee (DTC) and Antibiotic Stewardship Committee (ASC) meetings should be encouraged in private hospitals. It was noticed that 40.6% of survey respondents either did not have a DTC at present or one that met regularly within their hospital. Respondents did mention that, due to medical practitioners not being employed by the hospital, it was a challenge to get their attendance at such meetings. The DTC is a multidisciplinary group that is involved with formulary management, medication use evaluation, adverse drug reaction monitoring and reporting and issues of medication safety.<sup>76</sup> Respondents agreed that multidisciplinary ward rounds should also be encouraged within hospitals to aid in building therapeutic relationships and promoting collaborative prescribing practices within the hospital. This in turn will promote the progression of clinical pharmacy.

## 5.5 Basel Statements as a tool to monitor clinical pharmacy progress

The FIP Basel Statements on the Future of Hospital Pharmacy, developed in August 2008 and revised in September 2014, were designed to reflect the ideal vision of hospital pharmacy practice in a hospital pharmacy environment.<sup>7,8</sup> Multiple independent studies, in the Western Pacific region in particular, have been conducted to assess the current state of pharmacy practice, using the six aspects of hospital pharmacy practice as set out by these Statements.<sup>12,55,56</sup> These types of studies have not yet been conducted to assess the level of hospital pharmacy practice in South Africa. They are of value as they create a benchmark to assess pharmacy practice within hospitals for comparison and improvement, and to allow a means of comparison with studies conducted in other countries.<sup>8</sup>

The Basel Statements BS26 – BS32, dealing with “influence on prescribing”,<sup>7</sup> were successfully used as an aid to assess and compare multiple private hospitals within the same private hospital group with regard to their level of clinical pharmacy progression and the barriers experienced. Adaptation of the Basel Statements for use in the South African hospital practice and consideration of relevance of each Statement should be considered, as has been successfully done by the European Association of Hospital Pharmacists (EAHP).<sup>57,77</sup> As clinical pharmacy services progress in South Africa, the monitoring and surveying of these processes and systems through independent studies in both public and private hospitals will be beneficial, in order to observe potential barriers and suggest further methods to overcome them.

## 5.6 Limitations and remedial steps

The response rate for the qualitative phase of the study was poor and the planned minimum target was not achieved. A total of 7 respondents were included, out of 44 managers in the group, representing a response rate of 15.9%. In order to bolster the response, a regional clinical pharmacist was included in the sample group. The initial response deadline was also extended, and 7 selected pharmacy managers were approached directly, of which 3 responded and were included in the study. More time could have been dedicated to qualitative data collection during this phase and, if encouragement from the private hospital group head office had been received, a larger sample size could have been attained. However, saturation was deemed to have been achieved, as no new issues or themes appeared to emerge after the initial 7 interviews. That said, as the sample size for the qualitative study was small, and selected pharmacy managers had to be approached directly, it is possible that the views and attitudes of this group do not fully represent that of the entire population of pharmacy managers in the group. The non-responders may differ systematically from those who chose to respond, either in being less engaged with the issue of clinical pharmacy, or in holding views that are inimical to the



progression of clinical pharmacy in the South African private hospital sector. Nonetheless, it has been noted that response rate is not as important as saturation in determining external validity in qualitative research.<sup>78</sup>

The quantitative phase involved data collection through the use of SurveyMonkey, an online survey tool. In order to ensure that respondent confidentiality was maintained, all responses were completely anonymised and the email addresses of respondents was not captured. It was therefore possible a respondent could complete the survey more than once. An attempt was made to avoid this eventuality, as each reminder email that was sent out included specific instructions to not complete the survey a second time. It was also possible that multiple respondents from the same hospital could complete the survey, providing different (and perhaps inaccurate) hospital demographic details. Corporate data that was obtained to create the sample frame was thus used to determine actual hospital demographics for the group. The average hospital bed size within the private hospital group is 185 beds with the median hospital size being in the band of 100-199 beds (IQR: 100-299). From the survey data, the median was in the 200-299 bed band. The total number of pharmacists and pharmacy managers employed by the hospital group in January 2016, during data collection, was 258. Of these, only 243 could be included in the sample frame, due to invalid or unobtainable email addresses. Reasons for such invalid or unobtainable email addresses might have been the presence of new staff members who had not yet been issued with a corporate email address or the presence on the list of recently resigned staff members. The median number of pharmacists per hospital obtained from corporate records was 4 (IQR: 3-6), compared with the median of 6 pharmacists per hospital reported from the survey data. In hospitals of 100-199 beds the number of pharmacists employed varied from 3 to 5. In hospitals with 200-299 beds, corporate records showed that 7 or more pharmacists were commonly employed. The data obtained from the study was therefore closely related to the corporate data obtained and therefore the sample was considered a good reflection of the population. However, it might have been that respondents were more likely to be from larger hospitals rather than smaller, and hence more likely to be in a position to be exposed to more extensive clinical pharmacy services, including the employment of dedicated clinical pharmacists with limited distributory roles.

## 5.7 Summary

The perceived barriers to clinical pharmacy progression in the South African private hospital sector, as acknowledged by pharmacy managers and hospital pharmacists, need to be exposed in order to plan and implement remedial action.

The major barriers to clinical pharmacy progression that were identified in this study were:

- the educational needs of the clinical pharmacist and the lack of a recognized, structured undergraduate or post-graduate clinical pharmacy degree for specialist registration in South Africa;
- lack of confidence of the clinical pharmacist in his/her own clinical knowledge;
- the lack of registration of clinical pharmacy as a speciality category by the SAPC;
- the lack of established, clear defined roles and responsibilities of the clinical pharmacist in the hospital setting;
- lack of recognition of the role and support of the clinical pharmacist in patient care from hospital administrators as well as from the prescriber's, nurse's and patient's point of view;
- shortage of clinical pharmacists and the need for restructuring of staffing structures;
- the need for a clearly defined and established role for pharmacy technicians in private hospital settings; and
- the need for investment in technology, in order to compensate for resource limitations and specifically for medication safety purposes.

Support for clinical pharmacy progression at individual hospital management as well as from hospital group management level is essential for the progression of clinical pharmacy, if it is to become the primary role of the hospital pharmacist. Concluding remarks and recommendations on how to overcome these perceived barriers in order to advance its progression are provided in the following chapter.

## Chapter VI: Conclusions and Recommendations

Clinical pharmacy and the provision of services focused more on the pharmaceutical care of the patient, is slowly progressing within South African private hospitals. This “new” role is one that will further promote and add value to the pharmacist’s standing as a member of the multidisciplinary therapeutic team in contributing to better patient clinical outcomes. There are, however, a number of barriers that are impeding further progress of this role both internally (such as the lack of self-confidence and willingness of the hospital pharmacist to adapt to this change) and externally (which are often factors outside of the pharmacist’s control).

External or structural barriers to clinical pharmacy progression explored within this study were those of governmental and hospital influence, pharmacy operational factors and the further clinical educational requirements of the hospital pharmacist. Multiple perceived barriers were identified concerning governmental and hospital influence, but most significant was the lack of a recognised clinical pharmacist specialist registration category in South Africa, coupled to a clearly defined scope of practice. The exact role of the clinical pharmacist will remain unclear to pharmacists as well as other health care professionals and patients until the registration is finalised and promoted in society and the curricula of nurses and medical practitioners. Once finalised, implementation of a national clinical pharmacy programme accompanied by patient education in the public and private sector, will serve to promote the role and responsibility of the clinical pharmacist. Until then, governmental and hospital administrative support and recognition of clinical pharmacy is vital for the progression of this service. Individual hospitals should create opportunities for pharmacists to provide a clinical service and start to establish therapeutic relationships with other health care providers through the establishment and maintenance of multidisciplinary groups like DTC and ASC meetings. This will aid the implementation of the clinical pharmacy service, once registration with SAPC is eventually finalised.

Further barriers to clinical pharmacy progression identified were related to resource allocation in relation to staffing numbers, staff structure and time available to provide clinical services. Pharmacists in South Africa are a scarce skill occupation, so the availability of extra pharmacists per hospital or the use of current employees to provide additional clinical services over and above priority services, like medication distribution and dispensing, was identified as a challenge. The staff structure needs to adapt to include this additional role of the pharmacist. The use of pharmacy support staff, like pharmacy technicians, to provide the “foundation of the pharmacy’s distributive function”<sup>25</sup> is needed in South African hospitals as is currently being performed by pharmacy technicians in the US and elsewhere. Incorporating pharmacy technicians in the hospital pharmacy team will allow pharmacists

to start initiating and maintaining clinical services by providing personnel capable of supporting stable drug distributive and dispensing functions, currently occupying most of the hospital pharmacist's time. Therefore, there is a need for SAPC to further structure the role and responsibilities of pharmacy technicians in South Africa, more specifically in the private hospital sector, where their distinctive role compared to pharmacist's assistants (post basic) is unclear.

Technology, and in particular automated dispensing units, should be explored in private health care hospitals to strengthen the medication distributive system, especially in settings with limited human resources. Software applications (like Bluebird) have helped to empower the pharmacist to perform more clinical functions in the hospital, but there is a need to explore these applications further in order to build fully integrated electronic health recording systems, looking at all health-related data and not only antibiotic stewardship information.

Education and the pharmacist's lack of clinical knowledge was identified as a major barrier to clinical pharmacy progression. This was largely attributed to the lack of further formal clinical training as an entry-level requirement in the hospital setting. It was also reported that pharmacists are not taking personal responsibility for their own clinical knowledge. However, there is a need to restructure and standardise the current undergraduate degree to be more clinically-focused and create qualified pharmacists that can enter the hospital sector with the required skill set. A post-graduate degree option should also be made available, for those qualified pharmacists wanting to register as a clinical pharmacist, when the speciality register is finalised. Therefore, the implementation of a restructured, clinically-focused undergraduate pharmacy programme requires the co-implementation of a bridging post-graduate degree that acknowledges prior learning. The bridging options should include the possibility of part-time study, due to financial constraints and family obligations faced by current qualified full-time employed hospital pharmacists. The pharmacist's poor self-confidence and attitude to change is largely dependent on the lack of clinical knowledge and training received, as well as a lack of a clear and shared understanding of the clinical pharmacist's role.

The future of clinical pharmacy in South Africa will greatly benefit from the use of the Basel Statements as a tool to initiate studies in monitoring its progression and identifying its barriers. Adaptation of the Basel Statements to be more relevant to the South African setting will allow hospitals pharmacists to create a benchmark to which local hospitals in both the public and private sector could be held to account. In that way, the level of clinical pharmacy practice in their hospital could be compared and areas for improvement identified and acted upon.

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## **APPENDICES**

## Appendix A

### Ethical approval from the Biomedical Research Ethics Committee (BREC) of the University of KwaZulu-Natal



19 August 2015

Mr K can der Walt (214564747)  
Department of Pharmacology  
School of Health Sciences  
[kenneth.vanderwalt@netcare.co.za](mailto:kenneth.vanderwalt@netcare.co.za)

Protocol: Clinical pharmacy services in South Africa, and the factors hindering their progress.  
Degree: MSc BREC reference number: BE264/15

#### EXPEDITED APPLICATION

A sub-committee of the Biomedical Research Ethics Committee has considered and noted your application received on 01 June 2015.

The study was provisionally approved pending appropriate responses to queries raised. Your responses dated 06 August 2015 to queries raised on 27 July 2015 have been noted by a sub-committee of the Biomedical Research Ethics Committee. **The study is given full ethics approval on condition that gatekeeper permission must be submitted to BREC as soon as available.**

This approval is valid for one year from **19 August 2015**. To ensure uninterrupted approval of this study beyond the approval expiry date, an application for recertification must be submitted to BREC on the appropriate BREC form 2-3 months before the expiry date.

Any amendments to this study, unless urgently required to ensure safety of participants, must be approved by BREC prior to implementation.

Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2015), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>.

BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

The sub-committee's decision will be **RATIFIED** by a full Committee at its meeting taking place on **08 September 2015**

We wish you well with this study. We would appreciate receiving copies of all publications arising out of this study.

Yours sincerely

Professor J Tsoka-Gwegweni  
Chair: Biomedical Research Ethics Committee

cc supervisor: [Grava1@ukzn.ac.za](mailto:Grava1@ukzn.ac.za)  
cc postgrad: [nenept1@ukzn.ac.za](mailto:nenept1@ukzn.ac.za)

Biomedical Research Ethics Committee  
Professor J Tsoka-Gwegweni (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 2486 Facsimile: +27 (0) 31 260 4609 Email: [brec@ukzn.ac.za](mailto:brec@ukzn.ac.za)

Website: <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>



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## Appendix B

### Gatekeeper permission from the Research Operations Committee of the private hospital group

#### RESEARCH OPERATIONS COMMITTEE FINAL APPROVAL OF RESEARCH

Approval number: UNIV-2015-0056

Mr Kenneth van der Walt

E mail: Kenneth.vanderWalt@[REDACTED] co.za

Dear Mr Van der Walt

**RE: CLINICAL PHARMACY SERVICES IN A SOUTH AFRICAN PRIVATE HOSPITAL  
GROUP, AND THE FACTORS HINDERING THEIR PROGRESS**

The above-mentioned research was reviewed by the Research Operations Committee's delegated members and it is with pleasure that we inform you that your application to conduct this research at Pharmacies at Private Hospital Group, has been approved, subject to the following:

- i) Research may now commence with this FINAL APPROVAL from the Committee.
- ii) All information regarding the Company will be treated as legally privileged and confidential.
- iii) The Company's name will not be mentioned without written consent from the Committee.
- iv) All legal requirements with regards to participants' rights and confidentiality will be complied with.
- v) The Company must be furnished with a STATUS REPORT on the progress of the study at least annually on 30th September irrespective of the date of approval from the Committee as well as a FINAL REPORT with reference to intention to publish and probable journals for publication, on completion of the study.
- vi) A copy of the research report will be provided to the Committee once it is finally approved by the relevant primary party or tertiary institution, or once complete or if discontinued for any reason whatsoever prior to the expected completion date..
- vii) The Company has the right to implement any recommendations from the research.



- viii) The Company reserves the right to withdraw the approval for research at any time during the process, should the research prove to be detrimental to the subjects/ Company or should the researcher not comply with the conditions of approval.
- ix) APPROVAL IS VALID FOR A PERIOD OF 36 MONTHS FROM DATE OF THIS LETTER OR COMPLETION OR DISCONTINUATION OF THE STUDY, WHICHEVER IS THE FIRST.

We wish you success in your research.


Yours faithfully

 19/8/2015

Prof Dion du Plessis

Full member: Research Operations Committee & Medical Practitioner evaluating research applications as per Management and Governance Policy

Shannon Nell

  
Chairperson: Research Operations Committee

Date:

24/8/2015

This letter has been anonymised to ensure confidentiality in the research report. The original letter is available with author of research

## Appendix C

### Informed consent document for semi-structured interview sessions

#### Informed Consent

I \_\_\_\_\_ have been informed about the study entitled “Clinical pharmacy services in a South African private hospital group, and the factors hindering their progress” by Kenneth van der Walt (the researcher).

I understand the purpose and procedures of the study.

I understand that the interview may be recorded and that anonymous quoting may be used in reporting of this interview.

I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without penalty.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at 021 [REDACTED] or via email at [kenneth.vanderwalt@\[REDACTED\].co.za](mailto:kenneth.vanderwalt@[REDACTED].co.za).

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researcher then I may contact:

#### BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604769 - Fax: 27 31 2604609

Email: [BREC@ukzn.ac.za](mailto:BREC@ukzn.ac.za)

---

**Signature of Participant**

---

**Date**

## Appendix D

### Semi-structured interview questionnaire

Clinical pharmacy services in a South African private hospital group, and the factors hindering their progress.

The Basel Statements were set out by the Hospital Pharmacy Section of the International Pharmaceutical Federation in August 2008 and are a list of 75 statements developed to reflect the ideal vision of pharmacy practice in a hospital pharmacy environment. Six aspects describing the full scope of the profession within the hospital setting were incorporated within these statements.

Clinical pharmacy services, being that of a provision of pharmaceutical care to the patient outside of normal dispensing processes, is clearly described within the “influence on prescribing” aspect of the Basel statements (BS26 – BS32).<sup>1</sup>

- 26 Hospitals should utilize a medicine formulary system (local, regional, and/or national) linked to standard treatment guidelines, protocols, and treatment pathways based on the best available evidence.
- 27 Hospital pharmacists should be members of pharmacy and therapeutics committees to oversee all medicines management policies and procedures, including those related to off-label use and investigational medicines.
- 28 Hospital pharmacists should have a key role in educating prescribers at all levels of training on the access to and evidence for optimal and appropriate use of medicines, including the required monitoring parameters and subsequent prescribing adjustments.
- 29 Hospital pharmacists should be involved in all patient care areas to prospectively influence collaborative therapeutic decision-making.
- 30 Hospital pharmacists should be an integral part of all patient rounds to assist with therapeutic decision-making and advise on clinical pharmacy and patient safety issues.
- 31 Hospital pharmacists should provide continuity of care by transferring patient medicines information as patients move between sectors of care.
- 32 Postgraduate clinical courses should be developed to prepare hospital pharmacists for collaborative prescribing of medicines, including instruction in legal and professional accountability; this role of hospital pharmacists should be promoted in the curricula of other health professionals.

#### Interview questions

1. Can you briefly describe yourself in terms of age, gender, educational background and years of managerial and hospital pharmacy experience?
2. Going through each statement, to what extent are these processes implemented in your hospital?
3. What factors are challenging the implementation of these processes in your hospital?
4. What strategies could be used to approach and overcome these challenges in your hospital?
5. What are your feelings, views or attitudes towards the level of clinical pharmacy in South Africa?

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<sup>1</sup> International Pharmaceutical Federation. The Basel Statements on the future of hospital pharmacy. *American Journal of Health-System Pharmacy*. 2009;66:S61-S66.



## Appendix E

### Survey questionnaire administered through SurveyMonkey

**The perspectives of private hospital pharmacists towards clinical pharmacy in South Africa.**

Welcome to My Survey

Thank you for deciding to participate in my survey.

The aim and purpose of this study is to promote the implementation of clinical pharmacy services in South African private hospitals by identifying those factors perceived by a group of South African pharmacists as barriers.

The study is intended for all pharmacy managers and hospital pharmacists employed full-time within the [REDACTED] group throughout South Africa. It is a short survey and will not take longer than 15 minutes to complete.

Complete anonymity will be maintained throughout the survey. No personal information will be requested at any point and participant confidentiality will be maintained throughout the rest of the study. Your participation in this study will be completely voluntary and you may at anytime refuse to answer a particular question or continue further in the survey. There will be no penalty incurred if you refuse to continue in the study.

This study has been ethically reviewed and approved by the UKZN Biomedical Research Ethics Committee (approval number: BE264/15) and the [REDACTED] Research Operations Committee (UNIV-2015-0056).

Your feedback is very important.

**The perspectives of private hospital pharmacists towards clinical pharmacy in South Africa.**

Informed Consent

I understand the purpose and procedures of the survey.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without penalty.

I understand that complete anonymity will be maintained and the information provided may be used in reporting of this survey.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at 021 [REDACTED] or via email at kenneth.vanderwalt@[REDACTED].co.za.

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researcher then I may contact:

**BIOMEDICAL RESEARCH ETHICS ADMINISTRATION**

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Durban  
4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604769 - Fax: 27 31 2604609

Email: BREC@ukzn.ac.za

**\* 1. Please state whether you agree or disagree to the above mentioned statements:**

- ☐ I agree to the above statements and will continue with the survey
- ☐ I disagree to the above statements and will exit the survey

**The perspectives of private hospital pharmacists towards clinical pharmacy in South Africa.**

**Demographic Details (Pharmacist)**

Indicate your response for each of the following questions by selecting the appropriate box.

**2. What is your age?**

- ☐ 20 to 29
- ☐ 30 to 39
- ☐ 40 to 49
- ☐ 50 to 59
- ☐ 60 or older

**3. What is your gender?**

- ☐ Female
- ☐ Male

**4. What is the highest level of qualification that you have completed?**

- ☐ Diploma
- ☐ Bachelors
- ☐ MPharm
- ☐ MSc
- ☐ PharmD
- ☐ PhD
- ☐ Other (please specify)

**5. What is your occupational title?**

- ☐ Pharmacist
- ☐ Clinical/Ward Pharmacist
- ☐ Senior Pharmacist
- ☐ Pharmacy Manager
- ☐ Other (please specify)

**6. Years of experience as a qualified pharmacist?**

- ☐ 0 to 4
- ☐ 5 to 9
- ☐ 10 to 19
- ☐ 20 to 29
- ☐ 30 or more

**7. Years of experience as a hospital pharmacist?**

- ☐ 0 to 4
- ☐ 5 to 9
- ☐ 10 to 19
- ☐ 20 to 29
- ☐ 30 or more

**The perspectives of private hospital pharmacists towards clinical pharmacy in South Africa.**

**Demographic Details (Hospital)**

**8. Number of hospital beds:**

- ☐ less than 50
- ☐ 50 to 99
- ☐ 100 to 199
- ☐ 200 to 299
- ☐ 300 to 399
- ☐ 400 to 499
- ☐ 500 or more

**9. Number of Intensive Care Units:**

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more

**10. Total number of full-time employed pharmacists (including yourself) in your hospital:**

- ☐ 2 or less
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7 or more

**11. Total number of other full-time employed pharmaceutically trained staff members (excluding pharmacists) in your hospital:**

- ☐ 2 or less
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7 or more

**12. Total number of clinical or ward pharmacists working in your hospital:**

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more

## The perspectives of private hospital pharmacists towards clinical pharmacy in South Africa.

### Role of the Pharmacist

#### 13. Rank the following daily activities from highest priority (1) to lowest (6):

<input type="text"/>	<input type="text"/>	Ward rounds/ clinical work
<input type="text"/>	<input type="text"/>	Education and training of other healthcare professionals
<input type="text"/>	<input type="text"/>	Dispensing (including typing and checking inpatients medication charts and retail private prescriptions)
<input type="text"/>	<input type="text"/>	Patient counselling
<input type="text"/>	<input type="text"/>	Administrative work
<input type="text"/>	<input type="text"/>	Stock procurement and control (including capturing, stock taking, management of dormant stock and high schedule drug ward replenishments)

#### 14. Approximately what percentage of your time is spent on the following activities:

Ward rounds/ clinical work

Education and training of other healthcare professionals

Dispensing (including typing and checking inpatient medication charts and retail private prescriptions)

Patient counselling

Administrative work

Stock procurement and control (including capturing, stock taking, management of dormant stock and high schedule drug ward replenishments)

Please enter a positive whole number between 0 to 100 for each response so that all options add up to 100.

### The perspectives of private hospital pharmacists towards clinical pharmacy in South Africa.

#### Drug and Therapeutics Committee (DTC) and Antibiotic Stewardship Committee

**15. Is there a DTC that regularly meet within your hospital?**

- ☐ Yes  
☐ No

**16. How many pharmacists are currently involved in these meetings?**

- ☐ 0  
☐ 1  
☐ 2  
☐ 3  
☐ 4  
☐ 5 or more  
☐ N/A

**17. Is there an antibiotic stewardship programme currently in place in your hospital?**

- ☐ Yes  
☐ No

**18. Do you have an antibiotic stewardship committee that regularly meet within your hospital?**

- ☐ Yes  
☐ No

19. How many pharmacists are currently involved in this committee?

- ☐ 0  
☐ 1  
☐ 2  
☐ 3  
☐ 4  
☐ 5 or more  
☐ N/A

## The perspectives of private hospital pharmacists towards clinical pharmacy in South Africa.

### Clinical Pharmacy Overview

20. Indicate your level of agreement with the following statements by selecting the appropriate box:

	Agree fully	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree completely
Clinical pharmacy services should be the priority role of the hospital pharmacist.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of pharmacy technicians and robot dispensing could be beneficial for clinical pharmacy service development.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hospital pharmacists should be the primary providers of medication information and training to doctors and nurses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Further formal education or training courses are required for pharmacists to provide efficient clinical pharmacy services.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clinical pharmacists should carry more responsibility for the patient's clinical outcome.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regular multi-disciplinary ward rounds will create professional therapeutic relationships and promote collaborative prescribing practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The clinical pharmacist's role is clearly structured and understood by hospital pharmacists.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## The perspectives of private hospital pharmacists towards clinical pharmacy in South Africa.



## Progression of Clinical Pharmacy

### 21. What effect do you feel the following factors have on the progression of clinical pharmacy services as one of the primary roles of the hospital pharmacist in private hospitals?

	Negative effect	Somewhat negative effect	Has no effect	Somewhat positive effect	Positive effect
Current staffing structure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of time for clinical pharmaceutical services.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of confidence in own clinical knowledge.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Post-graduate clinical courses being made available.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clinical pharmacist registration with the South African Pharmacy Council (SAPC).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B.Pharm degree studied in clinical pharmacist preparation at hospital level.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of understanding of the role of the clinical pharmacist.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of hospital inpatients understanding of the role of the clinical pharmacist.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Support from other healthcare professionals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of understanding of the role of the clinical pharmacist as seen by other healthcare professionals (e.g. doctors and nurses).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Direct patient interaction and involvement at ward level.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Influence and support from governmental organisations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Influence and support from hospital management.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

### The perspectives of private hospital pharmacists towards clinical pharmacy in South Africa.

What are your thoughts on Clinical Pharmacy?

**22. Do you feel clinical pharmacy services have progressed to an adequate level in South African private hospitals?**

**23. If not, what other factors do you feel are hindering the progression of these services in South Africa?**

**24. Do you have any suggestions on strategies we can use to overcome these barriers?**

**25. What do you envision as the ideal role or position of the clinical pharmacist?**

You have now reached the end of the survey.

Thank you for taking the time to participate, I truly value the feedback you have provided.